S/M No.TCP830FEF0

Service Manual

CHASSIS : CP-830F

MODEL : DTH-29U7
DTH-29U8
DTH-2881
DTH-28W8
DTH-28W9

Caution
: In this Manual, some parts can be changed for improving. their performance without notice in the parts list. So, if you need the latest parts information, please refer to PPL(Parts Price List)in Service Information Center(http://svc.dwe.co.kr)

DAEWOO ELECTRONICS Corp.
http : //svc.dwe.co.kr
OTC 2003

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DOCUMENT HISTORY

VERSION	DATE	COMMENTS
V1.00	18/11/02	Creation of document (Author M Hearn) for project CP830 100Hz TV.
V1.01	22/11/02	Reformatting of the document, plus insertion of Document History section

1 MAIN FEATURES

1.1 SPECIFICATIONS

1.1.1 GENERAL

TV standard		PAL - SECAM B/G D/K, PAL I/I, SECAM L/L'
Colour system	Tuner	PAL, SECAM
	AV	PAL, SECAM, PAL 60, NTSC M, NTSC 4.43
Sound system		NICAM B/G, I, D/K, L, FM 2Carrier B/G, D/K
Power consumption		29"(4:3) Real Flat :84W approx. 28"(16:9) Real Flat : 84W approx.
Sound Output Power		7W x 2 (at 60% mod, 10%THD)
Speaker		12W 8 ohm x2
Teletext system		9 pages memory FASTEXT (FLOF or TOP)
Aerial input		75 ohm unbalanced
Channel coverage		Off-air channels, S-cable channels and hyperband
Tuning system		frequency synthesiser tuning system
Visual screen size		28" : 66cm 29" : 68cm
Channel indication		On Screen Display
Program Selection		100 programmes
Aux. terminal		EURO-SCART 1 : Audio / Video In and Out, R/G/B In, Slow and Fast switching. EURO-SCART 2 : Audio / Video In and Out, SVHS In. AV3 : Audio-Video Jack on front of cabinet. Headphone jack (3.5 mm) on front of cabinet SVHS3 (option) : Jack on front of cabinet ? sound input common with AV3.
Remote Control		R-46G22

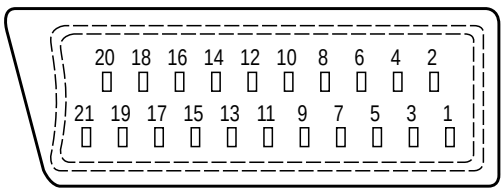
Unit

1.1.2 Pin	EURO-SCART 1 (21 Pin) Signal Description	Matching value
1	Audio Output Right	0.5 Vrms, Impedance < 1 kΩ, (RF 54% Mod)
2	Audio Input Right	0.5 Vrms, Impedance > 10 kΩ
3	Audio Output Left	0.5 Vrms, Impedance < 1 kΩ, (RF 54% Mod)
4	Audio Earth	
5	Blue Earth	
6	Audio Input Left	0.5 Vrms, Impedance > 10 kΩ
7	Blue Input	0.7 Vpp ±0.1V, Impedance 75Ω

9	Green Earth	
10	N.C.	
11	Green Input	0.7 Vpp ± 0.1V, Impedance 75Ω
12	N.C.	
13	Red Earth	
14	Blanking Earth	
15	Red Input	0.7 Vpp ±0.1V, Impedance 75Ω
16	Fast Switching	0 to 0.4V : Logic "0", 1 to 3V : Logic "1", Impedance 75Ω
17	Video Out Earth	
18	Video In Earth	
19	Video Output	1 Vpp ± 3dB, Impedance 75Ω
20	Video Input	1 Vpp ± 3dB, Impedance 75Ω
21	Common Earth	

1.1.3 EURO-SCART 2 (21 Pin)

Pin	Signal Description	Matching value
1	Audio Output Right	0.5 Vrms, Impedance < 1 kΩ (RF 54% Mod)
2	Audio Input Right	0.5 Vrms, Impedance > 10 kΩ
3	Audio Output Left	0.5 Vrms, Impedance < 1 kΩ, (RF 54% Mod)
4	Audio Earth	
5	Earth	
6	Audio Input Left	0.5 Vrms, Impedance > 10 kΩ
7	N.C.	
8	N.C.	
9	N.C.	
10	N.C.	
11	N.C.	
12	N.C.	
13	Earth	
14	Earth	
15	Chroma Input	±3dB for a luminance signal of 1 Vpp
16	N.C.	
17	Earth	
18	Video In Earth	
19	Video Output	1 Vpp ± 3dB, Impedance 75Ω (Monitor output)
20	Video Input, Y In.	1 Vpp ± 3dB, Impedance 75Ω
21	Common Earth	



1.2 CHANNEL/FREQUENCY TABLE

CHANNEL	EUROPE CCIR	FRANCE	GB(IRELAND)	EAST OIRT
C01	46.25	-	45.75	49.75
C02	48.25	55.75 (L')	53.75	59.25
C03	55.25	60.5 (L')	61.75	77.25
C04	62.25	63.75 (L')	175.25	85.25
C05	175.25	176.00	183.25	93.25
C06	182.25	184.00	191.25	175.25
C07	189.25	192.00	199.25	183.25
C08	196.25	200.00	207.25	191.25
C09	203.25	208.00	215.25	199.25
C10	210.25	216.00	223.25	207.25
C11	217.25	189.25 (LUX)	231.25	215.25
C12	224.25	69.25 (L')	239.25	223.25
C13	53.75	76.25 (L')	247.25	-
C14	-	83.25 (L')	49.75	-
C15	82.25	90.25	57.75	-
C16	-	97.25	65.75	-
C17	183.75	-	77.75	-
C18	192.25	-	85.75	-
C19	201.25	-	-	-
C20	-	-	-	-
C21	471.25	471.25	471.25	471.25
C22	479.25	479.25	479.25	479.25
C23	487.25	487.25	487.25	487.25
C24	495.25	495.25	495.25	495.25
C25	503.25	503.25	503.25503.25	
C26	511.25	511.25	511.25	511.25
C27	519.25	519.25	519.25	519.25
C28	527.25	527.25	527.25	527.25
C29	535.25	535.25	535.25	535.25
C30	543.25	543.25	543.25	543.25
C31	551.25	551.25	551.25	551.25
C32	559.25	559.25	559.25	559.25
C33	567.25	567.25	567.25	567.25
C34	575.25	575.25	575.25	575.25
C35	583.25	583.25	583.25	583.25
C36	591.25	591.25	591.25	591.25
C37	599.25	599.25	599.25	599.25
C38	607.25	607.25	607.25	607.25
C39	615.25	615.25	615.25	615.25
C40	623.25	623.25	623.25	623.25
C41	631.25	631.25	631.25	631.25
C42	639.25	639.25	639.25	639.25
C43	647.25	647.25	647.25	647.25
C44	655.25	655.25	655.25	655.25
C45	663.25	663.25	663.25	663.25

CHANNEL	EUROPE CCIR	FRANCE	GB(IRELAND)	EAST OIRT
C46	671.25	671.25	671.25	671.25
C47	679.25	679.25	679.25	679.25
C48	687.25	687.25	687.25	687.25
C49	695.25	695.25	695.25	695.25
C50	703.25	703.25	703.25	703.25
C51	711.25	711.25	711.25	711.25
C52	719.25	719.25	719.25	719.25
C53	727.25	727.25	727.25	727.25
C54	735.25	735.25	735.25	735.25
C55	743.25	743.25	743.25	743.25
C56	751.25	751.25	751.25	751.25
C57	759.25	759.25	759.25	759.25
C58	767.25	767.25	767.25	767.25
C59	775.25	775.25	775.25	775.25
C60	783.25	783.25	783.25	783.25
C61	791.25	791.25	791.25	791.25
C62	799.25	799.25	799.25	799.25
C63	807.25	807.25	807.25	807.25
C64	815.25	815.25	815.25	815.25
C65	823.25	823.25	823.25	823.25
C66	831.25	831.25	831.25	831.25
C67	839.25	839.25	839.25	839.25
C68	847.25	847.25	847.25	847.25
C69	855.25	855.25	855.25	855.25
C70	863.25	863.25	863.25	863.25
C71	69.25	-	-	-
C72	76.25	-	-	-
C73	83.25	-	-	-
C74	90.25	-	-	-
C75	97.25	-	-	-
C76	59.25	-	-	-
C77	93.25	-	-	-
S01	105.25	104.75	103.25	105.25
S02	112.25	116.75	111.25	112.25
S03	119.25	128.75	119.25	119.25
S04	126.25	140.75	127.25	126.25
S05	133.25	152.75	135.25	133.25
S06	140.25	164.75	143.25	140.25
S07	147.25	176.75	151.25	147.25
S08	154.25	188.75	159.25	154.25
S09	161.25	200.75	167.25	161.25
S10	168.25	212.75	-	168.25
S11	231.25	224.75	-	231.25
S12	238.25	236.75	-	238.25
S13	245.25	248.75	255.25	245.25
S14	252.25	260.75	263.25	252.25
S15	259.25	272.75	271.25	259.25
S16	266.25	284.75	279.25	266.25

CHANNEL	EUROPE CCIR	FRANCE	GB(IRELAND)	EAST OIRT
S17	273.25	296.75	287.25	273.25
S18	280.25	136.00	295.25	280.25
S19	287.25	160.00	303.25	287.25
S20	294.25	-	-	294.25
S21	303.25	303.25	-	303.25
S22	311.25	311.25	311.25	311.25
S23	319.25	319.25	319.25	319.25
S24	327.25	327.25	327.25	327.25
S25	335.25	335.25	335.25	335.25
S26	343.25	343.25	343.25	343.25
S27	351.25	351.25	351.25	351.25
S28	359.25	359.25	359.25	359.25
S29	367.25	367.25	367.25	367.25
S30	375.25	375.25	375.25	375.25
S31	383.25	383.25	383.25	383.25
S32	391.25	391.25	391.25	391.25
S33	399.25	399.25	399.25	399.25
S34	407.25	407.25	407.25	407.25
S35	415.25	415.25	415.25	415.25
S36	423.25	423.25	423.25	423.25
S37	431.25	431.25	431.25	431.25
S38	439.25	439.25	439.25	439.25
S39	447.25	447.25	447.25	447.25
S40	455.25	455.25	455.25	455.25
S41	463.25	463.25	463.25	463.25

1.3 ATSS SORTING METHOD

The TV set sweeps all the TV bands from beginning of VHF to end of UHF. The TV controlling software for each program checks if a VPS CNI code is transmitted (this system exists for German, Swiss and Austrian transmissions).
If no VPS CNI code is found, then the system checks if a CNI code is transmitted as part of the teletext transmission (Packet 8/30 format 1 and format 2). If such a code (VPS or teletext) is found and if this code is in the ATSS list, the program is automatically named.
If the transmission does not have VPS CNI, and no teletext service is available, then there is no possibility of the program being automatically named.
The programs found are then sorted in 4 groups :

Group I : It contains all the programs from the selected country and named by the TV controlling software. Within this group the sorting order is fixed by the ATSS list.
Group II : It contains all the programs with a strong signal strength which are not listed in group I.
Group III : It contains all the programs with a weak signal strength which are not listed in group I.
Group IV : If two or more programs with the same code are found, only the strongest (or if they have the same level the one with the lowest frequency) is listed in group I, II or III. The others are listed in group IV.

1.3.1 GENERAL CASE

Program number	Group	Skip
1	Group I	
2		
...		
n		
n+1	Group II	
...		
m		
m+1	Group III	
...		
p		
p+1	Group IV	
...		
q		
q+1	not used	
...		
99		
0		

1.3.2 SPECIAL CASE

Program number	Group	Skip
1	Group II	
...		
m		
m+1	Group III	
...		
p		
p+1	Group IV	
...		
q		
q+1	not used	
...		
99		
0		

Special case : Country selection = Others

Note : If two programs with the same name but a different code are found these two programs are listed in group I, II or III .

The sorting order within group II, III, and IV is based on the channel frequency. The program with the lowest frequency is allocated the first rank in its group, and so forth until the last program of the group which has the highest frequency.

Special case : **France**
If France is selected, the TV controlling software first sweeps all TV bands with France system selected (positive video modulation) and then a second time with Europe system selected (negative video modulation).

Special case : **Switzerland**
If Switzerland is selected the TV controlling software first sweeps all TV bands with Europe system selected (negative video modulation) and then a second time with France system selected (positive video modulation).

Special case : **GB**
Note for satellite receiver users : Before starting ATSS turn on your satellite receiver and tune to " SKY NEWS ".
If GB is selected the TV controlling software seeks for programs only in UHF (C21 to C70). The
sorting order is :
1 - BBC1
2 - BBC2
3 - ITV
4 - CH4
5 - CH5
6 ? NEWS (Sky News)

If two or more " identical "programs (same name but different code e.g. BBC1 and BBC1 Scotland) are found the following programs in the list will be shifted up. (1 - BBC1, 2 - BBC1, 3 -
BBC2, 4 - ITV, 5 - CH4, 6 - CH5, 7 - NEWS, ..)

If one of the programs above is not found, the associated program number remains empty (freq.=467.25 MHz - Skip selected - no name ? system = GB).
example A : 1 - BBC1, 2 - BBC2, 3 - ITV, 4 - -----, 5 - CH5, 6 - NEWS, ...
example B (if 2 BBC1 found) : 1 - BBC1, 2 - BBC1, 3 - BBC2, 4 - ITV, 5 - -----, 6 - CH5, 7 - NEWS, ...

2 SAFETY INSTRUCTION

WARNING: Only competent service personnel may carry out work involving the testing or repair of this equipment.

X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not exceed the specified limit. The nominal value of the high
voltage of this receiver is 25-26 KV (20”-21”) or 26 KV (25” - 28”) at max beam current. The high
voltage must not, under any circumstances, exceed 27.5 KV (20”), 29KV (21”), 29.5 KV (25”) or
30 KV (28”). Each time a receiver requires servicing, the high voltage should be checked. It is important to use an accurate and reliable high voltage meter.
2. The only source of X-RAY Radiation in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.

SAFETY PRECAUTION

Potentials of high voltage are present when this receiver is operating. Operation of the receiver outside the cabinet or with the back board removed involves a shock hazard from the receiver. Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions
necessary when working on high voltage equipment.
Discharge the high potential of the picture tube before handling the tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled.
If any Fuse in this TV receiver is blown, replace it with the FUSE specified in the Replacement Parts List.
When replacing a high wattage resistor (metal oxide film resistor) in the circuit board, keep the resistor 10 mm away from circuit board.
Keep wires away from high voltage or high temperature components.
This receiver must operate under AC 230 volts, 5O Hz. NEVER connect to a DC supply or any other voltage or frequency.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this equipment have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-RAY RADIATION protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements, electrical components having such features are identified by designated symbol on the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitutes replacement parts which do not have the same safety characteristics as specified in the parts list may create X-RAY Radiation.

3 ALIGNMENT INSTRUCTIONS

3.1MICROCONTROLLER CONFIGURATION : SERVICE MODE
To switch the TV set into service mode please see instruction below.

1 - Select PR. number 91
2 - Adjust sharpness to minimum and exit all menus.
3 - Within 2 seconds press the key sequence : **RED - GREEN - menu**

The software version is displayed beside the word Service, e.g. "SERVICE V1.00".

To exit SERVICE menu press menu key or **Std By** key.
3.2SERVICE MODE NAVIGATION

Pr Up/Down remote keys : cycle through the service items available.
Vol -/+ remote keys : Dec./Increment the values within range - Cycle trough option bits.
OK key : Toggle bits in option byte

Order	Item	Default setting
1	HOR CEN	
2	RED GAIN	
3	GRN GAIN	
4	BLUE GAIN	
5	RED BIAS	
6	GRN BIAS	
7	AGC LEVEL	
8	G2 - SCREEN	
9	AFT	
10	OPTION1	
11	OPTION2	
12	PARABOLA	
13	HOR WIDTH	
14	CORNER T	
15	CORNER B	
16	HOR. PARAL	
17	V. LINEAR	
18	EW TRAPEZ	
19	S CORRECT	
20	VERT CENT	
21	VERT SIZE	

3.3 MICROCONTROLLER CONFIGURATION : OPTION BITS

There are two option bytes available (16 bits in all). These option bits are available from Service mode. First find the OPTION1 or OPTION2 control, and then use the Volume PLUS/MINUS buttons on the remote control keypad to locate the bits, and OK key to toggle them. The table below shows the two option bytes available;

3.3.1 OPTION 1

	B7	B6	B5	B4	B3	B2	B1	B0
1	TOP text OFF	FASTEXT (FLOF) OFF	TUBE 4:3	Headphone Volume/Balance control OFF	Dolby Virtual OFF	SVHS 3 disable	Tuner options 00 = Philips 01 = not used 10 = ALPS 11 = PARTSNIC (DW)	
0	TOP text ON	FASTEXT (FLOF) ON	TUBE 16:9	Headphone Volume/Balance control ON	Dolby Virtual ON	SVHS 3 enable		

3.3.2 OPTION 2

	B7	B6	B5	B4	B3	B2	B1	B0
1	Fixed to '0'	JVC remote control	AVL control OFF	PICTURE TILT ON	Program list enabled	See table below.		
0		Daewoo Remote control	AVL control ON	PICTURE TILT OFF	Program list disabled			

Tube	Beam Current (mA)		B2	B1	B0
	Nominal	Max			
	0.95	1.10	0	0	0
	1.00	1.15	0	0	1
4/3 - Super Flat, 16/9 – Super Flat	1.05	1.20	0	1	0
	1.10	1.25	0	1	1
	1.20	1.35	1	0	0
	1.25	1.40	1	0	1
4/3 - Real Flat, 16/9 – Real Flat	1.30	1.45	1	1	0
	1.35	1.50	1	1	1

All values modified are immediately memorised in eeprom.

3.4 TV SET ALIGNMENT

3.4.1 LOCAL OSCILLATOR ALIGNMENT

Tune a colour bar pattern. The frequency of the signal carrier must be accurate (Max +/- 10KHz deviation from the nominal channel frequency).

Find "AFT" item in service mode.

Adjust the coil L150 to bring the cursor to central position : 32.

3.4.2 G2 ALIGNMENT

- Tune a colour bar pattern.
- Find the "G2 - SCREEN" item in service mode.
- Adjust screen volume (on FBT) to bring the cursor to central position : 32.

3.4.3 WHITE BALANCE

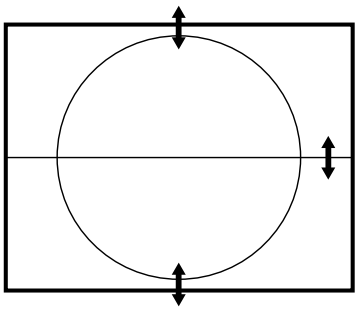
- Select a dark picture and adjust RED BIAS and GRN BIAS to the desired colour temperature.
- Select a bright picture and adjust RED, GRN and BLUE GAIN to the desired colour temperature.

3.4.4 FOCUS

Adjust the Focus volume (on FBT) to have the best resolution on screen.

3.4.5 VERTICAL GEOMETRY

Adjust V. LINEAR (linearity), S CORRECT (S. Correction), VERT SIZE (Vertical amplitude), VERT CENT (vertical centring) to compensate for vertical distortion.

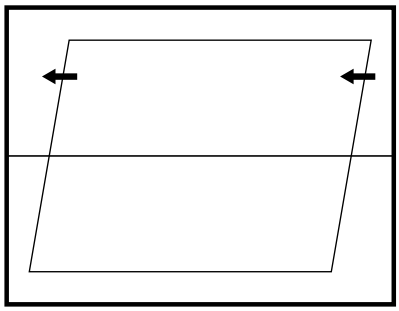


3.4.6 HORIZONTAL PICTURE CENTRING

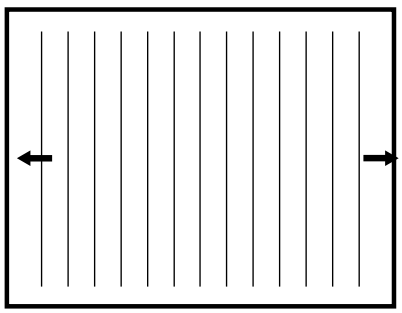
Adjust HOR CEN (Horizontal centre) to have the picture in the centre of the screen.

3.4.7 EAST / WEST CORRECTION

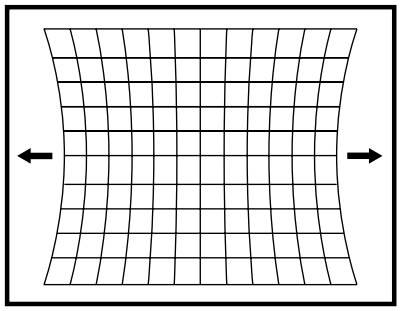
Adjust the PARABOLA, HOR WIDTH, CORNER, HOR PARAL, EW TRAPEZ, to compensate for geometrical distortion.



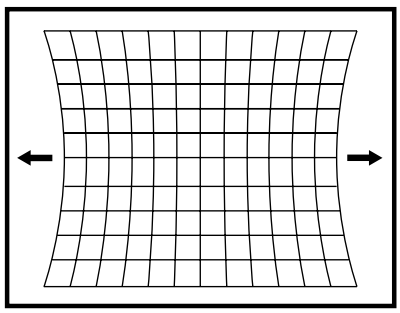
HOR PARAL



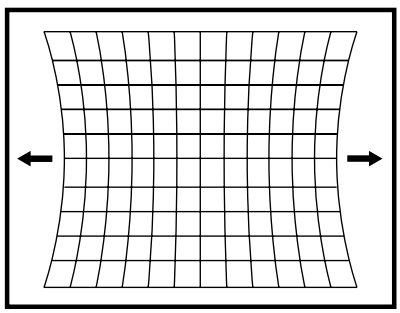
HOR WIDTH
adjust for 93% overscan.



PARABOLA



CORNER B & CORNER T



EW TRAPEZ

3.4.8 AGC

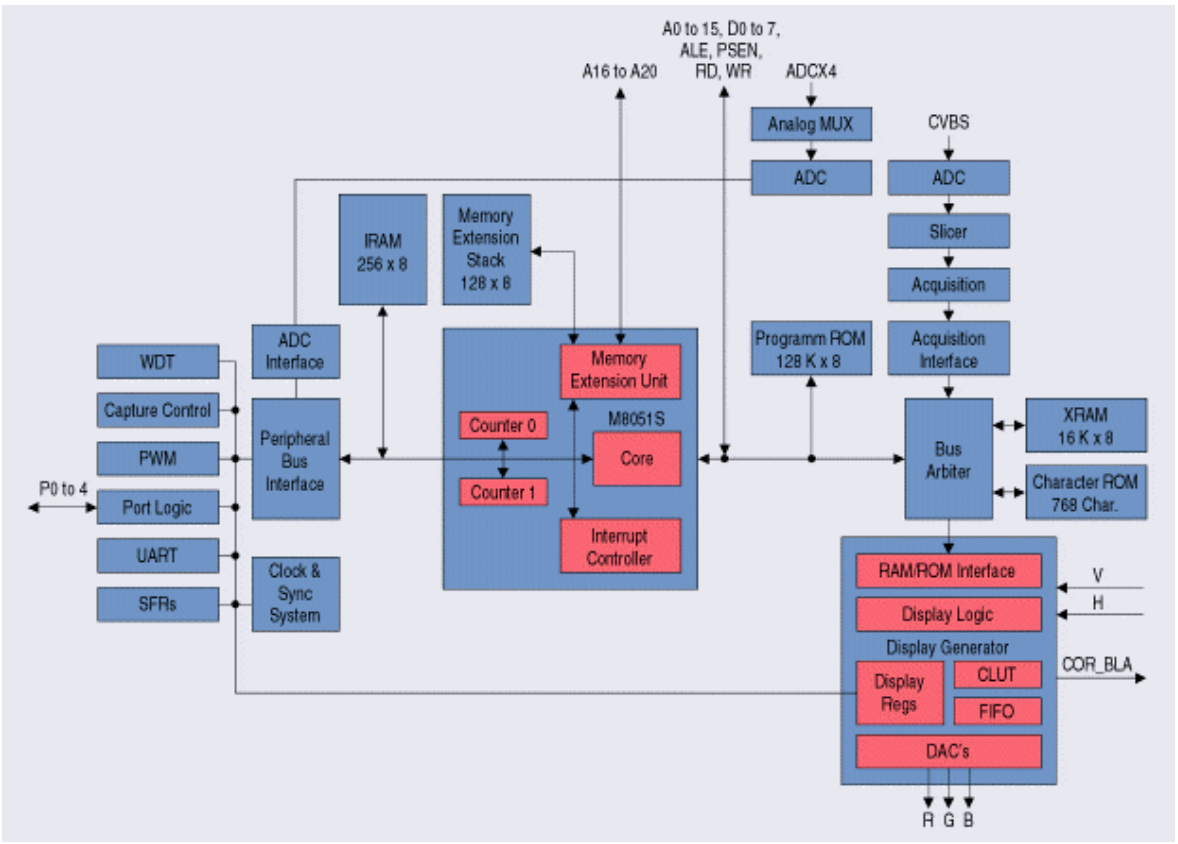
- Make sure option bits are correct for the tuner fitted on the chassis (See above how to change option bits).
- Adjust the antenna signal level at 64 dBμV± 2
- Tune a colour bar pattern.
- Find the "AGC" item in service mode.
- Press the key "OK" on the remote keypad and wait until AGC level stabilise to the optimum value.
- Alternatively, use "Vol Up/Dwn" keys to adjust manually to the desired Tuner Take Over Point (TOP).

4 IC DESCRIPTION

4.1 TELETEXT DECODER WITH EMBEDDED 8-BIT CONTROLLER

TVText Pro is a 8-bit controller based on a enhanced 8051 core with embedded teletext, On screen Display and TV controller functions.

4.1.1 BLOCK DIAGRAM OF THE SDA55XX



4.1.2 DESCRIPTION

The SDA 55xx is a single chip teletext decoder for decoding World System Teletext data as well as Video Programming System (VPS), Program Delivery Control (PDC), and Wide Screen Signalling (WSS) data used for PAL plus transmissions (line 23).

The device provides an integrated general-purpose, fully 8051-compatible Microcontroller with television specific hardware features. The microcontroller has been enhanced to provide powerful features such as memory banking, data pointers and additional interrupts etc.

The on-chip display unit for displaying Level 1.5 teletext data is also used for customer defined on-screen displays. Internal XRAM consists of 16 Kbytes. Device has an internal ROM of 128 Kbytes.

The SDA 55xx supports a wide range of standards including PAL, NTSC and contains a digital slicer for VPS, WSS, PDC, TTX and Closed Caption, an accelerating acquisition hardware module, a display generator for Level 1.5 TTX data and powerful On screen Display capabilities based on parallel attributes, and Pixel oriented characters (DRCS).

The 8-bit Microcontroller runs at 360 ns. cycle time (min.). Controller with dedicated hardware does most of the internal TTX acquisition processing, transfers data to/from external memory interface and receives/transmits data via I 2 C-firmware user-interface. The slicer combined with dedicated hardware stores TTX data in a VBI buffer of 1 Kilobyte. The Microcontroller firmware performs all the acquisition tasks (hamming-and parity-checks, page search

and evaluation of header control bits) once per field. Additionally, the firmware can provide high-end Teletext-features like Packet-26-handling, FLOF, TOP and list-pages.

4.1.3 IC MARKING AND VERSION

Chassis	IC marking	OSD languages	ATSS countries	Text
CP830		BULGARIAN, CZECH, GERMAN, DANISH, SPANISH, FRENCH, FINNISH, ENGLISH, GREEK, HUNGARIAN, ITALIAN, NORWEGIAN, DUTCH, POLISH, ROMANIAN, RUSSIAN, SWEDISH, SLOVAKIAN.	Austria, Belgium, Switzerland, Czech Republic, Germany, Denmark, Spain, France, Finland, GB, Greece, Hungary, Italy, Ireland, Norway, Netherlands, Portugal, Poland, Sweden, Slovak Republic, Others	PAN-EUROPEAN LATIN, CYRILLIC, GREEK.

4.1.4 PINNING

PSDIP 52-pin	Pin Name	Type	Short Description
1	SCL	IN/OUT	Software driven I2C bus Clock line
2	SDA	IN/OUT	Software driven I2C bus Data line
3	S/SW2	IN	Slow switching control for SCART 2.
4	S/SW2	IN	(See Microcontroller I/O pin configuration)
5	S/SW1	IN	Slow switching control for SCART 1.
6	S/SW1	IN	(See Microcontroller I/O pin configuration)
7	n.c.		
8	Reset Out	OUT	Driven by controlling software to reset video IC's.
9	VDD2.5	IN	Supply voltage 2.5V
10	VSS	IN	Ground (0V)
11	VDD3.3	IN	Input/Output 3.3V
12	CVBS	IN	CVBS input for the acquisition circuit
13	VDDA2.5	IN	Supply voltage for analog components
14	VSSA	IN	Ground for analog components
15	AFT	IN	ADC input, AFT input
16	AGC	IN	ADC input, for AGC alignment only
17	KEY	IN	ADC input, local key sensing
18	OCP	IN	Switch Off the set when the voltage goes below a trigger level
19	HS	IN	Horizontal sync for OSD/Txt synchronisation
20	VS	IN	Vertical sync for OSD/Txt synchronisation
21	MODESW	OUT	High : Negative video modulation (B, G, D, K,I) Low : Positive video modulation (L / L')
22	L/L'	OUT	High : L', Low : L
23	IR	IN	Remote control signal input
24	INT	IN	Interrupt input from audio processor

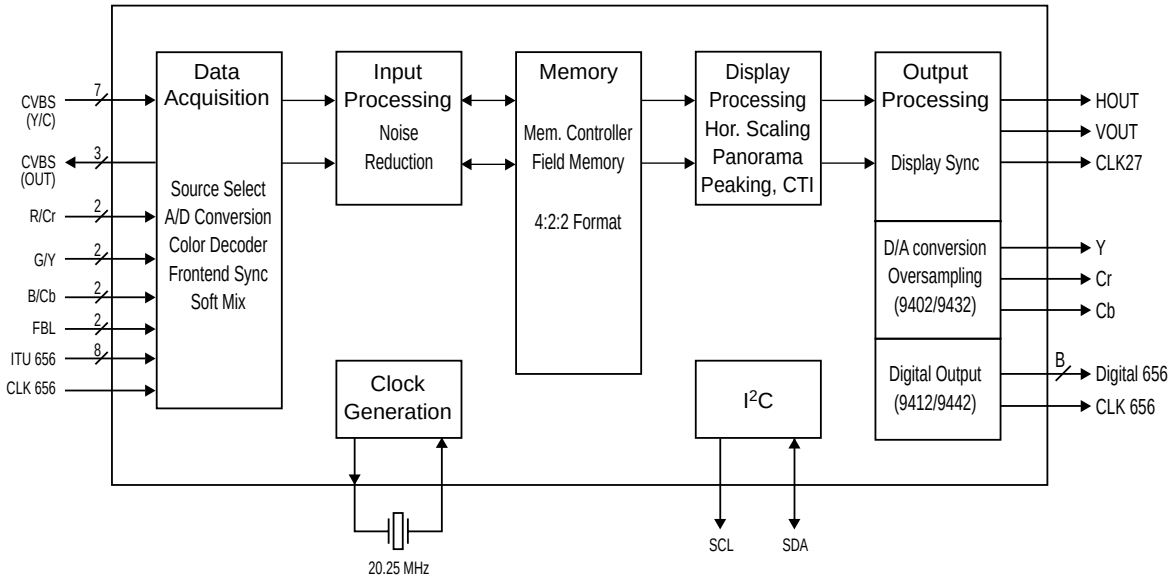
PSDIP 52-pin	Pin Name	Type	Short Description
25	n.c.		
26	n.c.		
27	n.c.		
28	n.c.		
29	VSS	IN	Ground (0V)
30	VDD3.3	IN	Input/Output 3.3V
31	n.c.		
32	n.c.		
33	RESET	IN	A low level on this pin resets the device.
34	XTAL2	OUT	Output of the inverting oscillator amplifier
35	XTAL1	IN	Input of the inverting oscillator amplifier
36	VSSA	IN	Ground for analog components
37	VDDA2.5	IN	Supply voltage for analog components
38	R OUT	OUT	Red output
39	G OUT	OUT	Green output
40	B OUT	OUT	Blue output
41	BK OUT	OUT	Blanking
42	VDD2.5	IN	Supply voltage 2.5V
43	VSS	IN	Ground (0V)
44	VDD3.3	IN	Input / Output 3.3V
45	n.c.		
46	n.c.		
47	n.c.		
48	AGC	OUT	Tuner TOP adjustment
49	n.c.		
50	n.c.		
51	LED	OUT	High : Green LED, Low : Red LED
52	POWER	OUT	High : SMPS ON, Low : SMPS in stand by

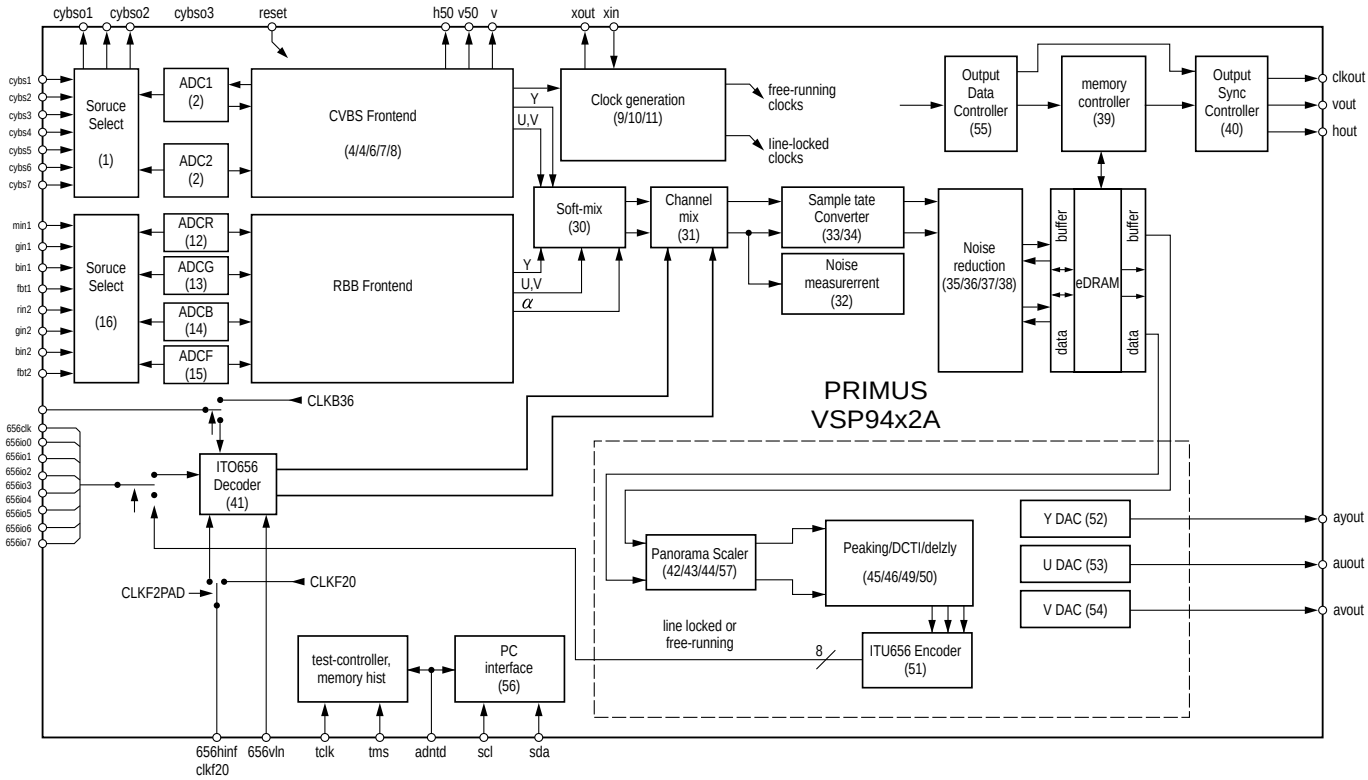
4.2 VSP9412A - SCAN RATE CONVERTER INCLUDING MULTISTANDARD COLOUR DECODER

The VSP 94x2A comprises all main functions of a digital featurebox in one monolithic IC.

The device comprises a digital multistandard color decoder, a RGB interface with fast-blank capability (SCART), digital ITU656 input, scaling units including panorama, embedded DRAM for upconversion, picture improvements, temporal noise reduction as well as A/D and D/A converter.

4.2.1 BLOCK DIAGRAM OF THE VSP9412A





4.2.2 DESCRIPTION

- **Integrated Video Matrix switch**
  - Up to seven CVBS inputs, up to two Y/C inputs,
  - Up to three CVBS outputs (even when Y/C input)
  - 9 bit amplitude resolution for CVBS, Y/C A/D converter
  - AGC (Automatic Gain Control)

- **Multi-standard colour decoder**
  - PAL/NTSC/SECAM including all substandards
  - Automatic recognition of chroma standard
  - Only one crystal necessary for all standards
- **RGB-FBL or YUV-H-V input**
  - 8 bit amplitude resolution for RGB or YUV
  - 8 bit amplitude resolution for FBL or H
- **ITU656 support**
  - ITU656 output
  - DS656 output (double-scan '656like' output)
- **Noise reduction**
  - Motion adaptive temporal noise reduction
  - Field-based temporal noise reduction for luminance and chrominance
  - Different motion detectors for luminance and chrominance or identical
  - Flexible programming of the temporal noise reduction parameters
  - Automatic measurement of the noise level
- **Horizontal scaling of the 1fH signal**
  - Split-screen possible with additional PiP or Text processor
- **Flexible digital horizontal scaling of the 2fH signal (Not used in this chassis)**
  - Scaling factors: 3, ... [2 pixel resolution], ..., 0.75 including 16:9 compatibility
  - 5 zone panorama generator
- **Embedded memory**
  - On-chip memory controller
  - Embedded DRAM core for field memory
  - SRAM for PAL/SECAM delay line
- **Data format 4:2:2**
- **Flexible clock and synchronisation concept**
  - Horizontal line-locked or free-running mode
  - Vertical locked or free-running mode
- **Scan-rate-conversion**
  - Simple interlaced modes (100/120 Hz): AABB, AAAA, BBBB (9402A/9412A only)
- **Flexible output sync controller**
  - Flexible positioning of the output signal
  - Flexible programming of the output sync raster
  - 'Blank signal' generation
- **Signal manipulations**
  - Still field
  - Insertion of coloured background
  - Windowing
  - Vertical chrominance shift for improved VCR picture quality
- **Sharpness improvement (not used in this chassis)**
  - Digital color transition improvement (DCTI)
  - Peaking (luminance)
- **1920 active pixel/per line in default configuration**
- **I²C-bus control (400 kHz)**
  - selectable I²C address
- **1.8V ± 5% and 3.3V ± 5% supply voltages**
- **P-MQFP-80 package**

4.2.3 PINNING

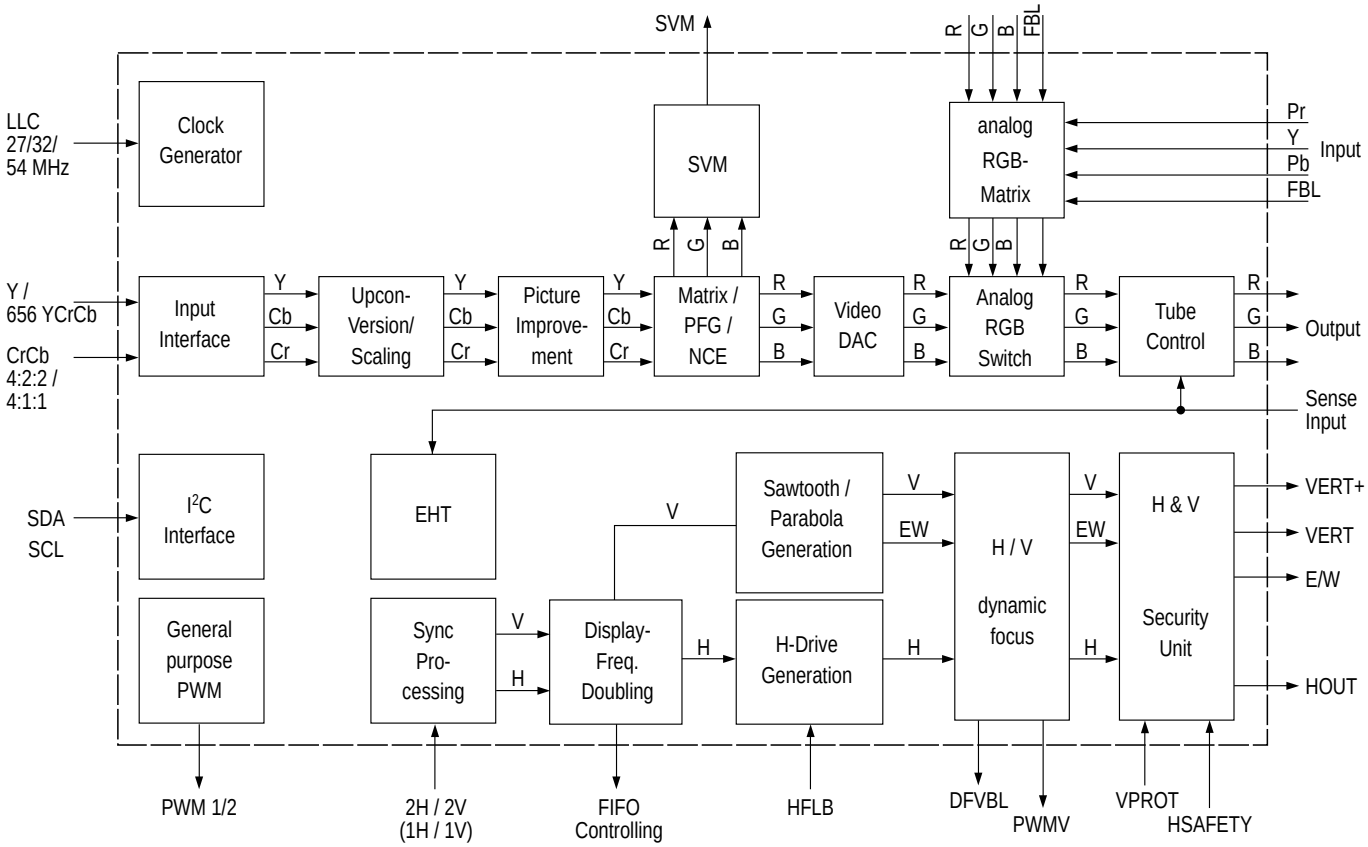
Pin	Name	I/O	Description	Remarks
52	cvbs1	I	CVBS input	
53	cvbs2	I	CVBS input	
54	cvbs3	I	CVBS input	
55	cvbs4	I	CVBS input or Y1	
56	cvbs5	I	CVBS input or C1	
57	cvbs6	I	CVBS input or Y2	
58	cvbs7	I	CVBS input or C2	
63	Cvbso1	O	CVBS output 1	
62	Cvbso2	O	CVBS output 2	
61	Cvbso3	O	CVBS output 3	
70	Xin	I	Crystal connection 1	
69	Xout	O	Crystal connection 2	
23	Vout	O	Vertical output	
17	Hout	O	Horizontal output	
3	i656i7	I	656 input (MSB)	
2	i656i6	I	656 input	
1	i656i5	I	656 input	
80	i656i4	I	656 input	
79	i656i3	I	656 input	
78	i656i2	I	656 input	
77	i656i1	I	656 input	
76	i656i0	I	656 input (LSB)	
75	i656iclk	I	656 input clock	
39	Rin1	I	R in 1	
40	Gin1	I	G in 1	
41	Bin1	I	B in 1	
37	Fbl1	I	Fast Blank input 1	
46	Rin2	I	R in 2	
47	Gin2	I	G in 2	
48	Bin2	I	B in 2	
38	Fbl2	I	Fast Blank input 2	
14	V	I	Vertical pulse for RGB input	
6	Sda	I/O	I2C ?Bus data	
13	Scl	I	I2C ?Bus clock	
7	Tms	I	Test mode select	
19	Adr/tdi	I	I2C Address / test data in	
24	Reset	I	Reset input	Reset when low
27	Clkout	O	Output clock	27MHz
59	Vdd33c	S	Supply voltage CVBS	3.3V
60	Vss33c	S	Supply voltage CVBS	0V
50	Vddac1	S	Supply voltage CVBS1	1.8V
51	Vssac1	S	Supply voltage CVBS1	0V
64	Vddac2	S	Supply voltage CVBS2	1.8V
65	Vssac2	S	Supply voltage CVBS2	0V
44	Vdd33rgb	S	Supply voltage RGB	3.3V

Pin	Name	I/O	Description	Remarks
45	Vss33rgb	S	Supply voltage RGB	0V
42	Vddargb	S	Supply voltage for RGB	1.8V
43	Vssargb	S	Supply voltage for RGB	0V
35	Vddafbl	S	Supply voltage for FBL	1.8V
36	Vssafbl	S	Supply voltage for FBL	0V
68	Vddapll	S	Supply voltage for PLL	1.8V
66	Vddd1	S	Supply voltage for digital	1.8V digital
67	Vssdl	S	Supply voltage for digital	0V digital
5	Vddd2	S	Supply voltage for digital	1.8V digital
4	Vssd2	S	Supply voltage for digital	0V digital
28	Vddd3	S	Supply voltage for DRAM	1.8V digital
29	Vssd3	S	Supply voltage for digital	0V digital
34	Vddd4	S	Supply voltage for digital	1.8V digital
33	Vssd4	S	Supply voltage for digital	0V digital
72	Vddp1	S	Supply voltage for digital	3.3V pad
73	Vssp1	S	Supply voltage for digital	0V digital
12	Vddp2	S	Supply voltage for digital	3.3V pad
11	Vssp2	S	Supply voltage for digital	0V pad
25	Vddp3	S	Supply voltage for digital	3.3V pad
26	Vssp3	S	Supply voltage for digital	0V pad
71	Tclk	I	Testclock	Connect to vss
18	H50	O	Hout 50 Hz	
20	V50	O	Vout 50 Hz	
32	656io0	I/O	Digital input / output	LSB
31	656io1	I/O	Digital input / output	
30	656io2	I/O	Digital input / output	
22	656io3	I/O	Digital input / output	
21	656io4	I/O	Digital input / output	
16	656io5	I/O	Digital input / output	
15	656io6	I/O	Digital input / output	
10	656io7	I/O	Digital input / output	
9	656clk	I/O	Digital input / output clock	
74	656hin/clkf20	I/O	Separate H input for 20.25 clock output	
8	656vin/blank	I/O	Separate V input for 656 / BLANK output	
49	Vssd5	S	Supply voltage for digital	0V

4.3 DDP 3315C - DISPLAY AND DEFLECTION PROCESSOR

The DDP 3315C is a mixed-signal single-chip digital display and deflection processor, designed for high-quality backend applications in double scan and HDTV TV sets with 4:3 or 16:9 picture tubes. The interfaces qualify the IC to be combined with state of the art digital scan rate converters, as well as analog HDTV sources. The DDP 3315C contains the entire digital video component, deflection processing, and all analog interfaces to display the picture on a CRT.

4.3.1 BLOCK DIAGRAM OF THE DDP 3315C



4.3.2 DESCRIPTION

Video Processing

- linear horizontal scaling (0.25 ... 4), as well as nonlinear horizontal scaling "panorama vision"
- dynamic black level expander
- luma sharpness enhancement by dynamic peaking and luma transient improvement (LTI)
- color transient improvement (CTI)
- programmable RGB matrix
- black stretch, blue stretch, gamma correction via programmable Non-linear Colorspace Enhancer (NCE) on RGB
- two analog double scan inputs with fast blank (one RGB and one RGB/YC r C b /YP r P b selectable)
- average and peak beam current limiter
- automatic picture tube adjustment (cutoff, drive)
- histogram calculation

Deflection Processing

- scan velocity modulation output
- digital EHT compensation for vertical / east-west
- soft start/stop of horizontal-drive
- vertical angle and bow correction
- differential vertical outputs
- vertical zoom via deflection adjustment
- horizontal and vertical protection circuit

- horizontal frequency for VGA/SVGA/1080I
- black switch off procedure
- supports horizontal and vertical dynamic focus

Miscellaneous

- selectable ITU-R 601 4:1:1 / 4:2:2 YC r C b input at 27/32 MHz or double scan ITU-R 656 input at 54 MHz line-locked clock
- crystal oscillator for horizontal safety
- picture frame generator
- hardware for simple 50/60 Hz to 100/120 Hz conversion (display frequency doubling)
- PQFP80 package, 5 V analog and 3.3 V digital supply

IC architecture

A clock generator converts different external line locked clock rates to a common internal sample rate of ~40 MHz, in order to provide a higher horizontal resolution. The input interface accepts ITU-R 601 at 27 or 32 MHz and ITU-R 656 with encoded or external sync at 54 MHz. The horizontal scaler is used for the scan rate conversion and for the nonlinear aspect ratio conversion as well.

For the picture improvement, luma and chroma are processed separately. The luminance contrast ratio can be extended with a dynamic black level expander. In addition the frequency characteristic is improved by a transient improvement (LTI) and an adaptive dynamic peaking circuit. The peaking adapts to small AC amplitudes of high frequency parts, while large AC amplitudes are processed by the LTI. The chroma signal is enhanced with a transient improvement (CTI) with proper limitation to avoid wrong colours. The full programmable RGB matrix covers control of colour saturation and temperature. A digital white drive control is used to adjust the white balance and for the beam current limitation to prevent the CRT from over-load. A non-linear colorspace enhancer (NCE) for RGB gives full flexibility for any amplitude characteristic. High speed10-bit D/A converters are used to convert digital RGB to analog signals. Separate 9-bit D/A converters control brightness and cutoff. For picture tubes equipped with an appropriate yoke a scan velocity modulation (SVM) signal is calculated using a differentiated luminance signal.Two analog sources can be inserted in the main RGB, controlled by separate fastblank (FBL) signals. Contrast and brightness are adjusted separately from main RGB. One input is dedicated to RGB for on screen display (OSD). The second input is processed with an analog RGB matrix to insert YCbCr/YpbPr or RGB with control of colour saturation and programmable half contrast. The bandwidth of ~30MHz guarantees pixel based graphics to be displayed with full accuracy. All previously mentioned features are implemented in dedicated hardware. An integrated processor controls the horizontal and vertical deflection, tube measurement loops and beam current limitation. It is also used to calculate an amplitude histogram of the displayed image.

The horizontal deflection is synchronized with two numeric phase-locked loops (PLL) to the incoming sync. One PLL generates the horizontal timing signals, e.g. blanking and key-clamping. The second PLL adjusts the phase of the horizontal drive pulse with a subpixel accuracy less than 1 ns.

Vertical deflection and east/west correction waveforms are calculated as 6th order polynomials. This allows adjustment of an east/west parabola with trapezoidal, pincushion and an upper/lower corner correction (even for real flat CRT's), as well as a vertical sawtooth with linearity and S-correction. Scaling both waveforms, and limiting to fix amplitudes, performs a vertical zoom or compression of the displayed image. A field and line frequent control loop compensates picture content depending EHT distortions.

4.3.3 PINNING

Pin No.	Pin Name	I/O	Description	Remarks
1	Y6	I	Picture bus Luma	
2	Y7	I	Picture bus Luma (MSB)	
3	656EN	I	Enable 656 input mode	
4	LLC2	I	System clock input	
5	HS	I	Horizontal Sync Input	
6	VS	I	Vertical Sync Input	
7	FREQSEL	I	Selection of H-Drive Frequency Range	
8	CM1	I	Clock select 1	
9	CM0	I	Clock select 0	
10	VS2	I	Additionnal VSYNC input	
11	XTAL2	O	Analog Crystal Output	
12	XTAL1	I	Analog Crystal Input	
13	NC			
14	GNDP	S	Ground, Output Pin Driver	
15	VSUPP	S	Supply voltage, Output Pin Driver	
16	FIFORRD	O	FIFO Read Counter Reset	
17	FIFORD	O	FIFO Read Enable	
18	FIFOWR	O	FIFO Write Enable	
19	FIFORWR	O	FIFO Write Counter Reset	
20	PWM1	O	I2C controlled DAC	
21	PWM2	O	I2C controlled DAC / Tilt output	
22	PWMV	O	I2C controlled DAC	
23	HOUT	O	Horizontal drive output	
24	VSTBY	S	Standby supply voltage, Hout generation	
25	DFVBL	O	Dynamic focus blanking / horizontal DAF	
			pulse	
26	HSYNC	O	Horizontal sync output	
27	VSYNC	O	Vertical sync output	
28	NC			
29	ASG1	S	Analog Shield Ground	
30	HFBL	I	Horizontal flyback input	
31	SAFETY	I	Safety input	
32	VPROT	I	Vertical protection input	
33	RSW2	O	Range Switch2, measurement ADC	
34	RSW1	I/O	Range Switch1, measurement ADC	
35	SENSE	I	Sense ADC input	
36	GNDM	S	Ground, MADC input	
37	VERT+	O	Differential Vertical Sawtooth Output	
38	VERT-	O	Differential Vertical Sawtooth Output	
39	EW	O	East / West Correction Output	

Pin No.	Pin Name	I/O	Description	Remarks
40	NC			
41	SVM	O	Scan Velocity Modulator	
42	ROUT	O	Analog Output Red	
43	GOUT	O	Analog Output Green	
44	BUT	O	Analog Output Blue	
45	GNDO	S	Ground, analog Back End	
46	XREF	I	Reference Input for RGB DAC's	
47	VSUPO	S	Supply voltage, Analog Back End	
48	VRD/BCS	I	DAC Reference, Beam current safety	
49	AGND	S	Analog Ground for Analog Matrix	
50	FBLIN1	I	Fast Blank1input	
51	RIN1	I	Analog Red1input	
52	GIN1	I	Analog Green1 input	
53	BIN1	I	Analog Blue1input	
54	FBLIN2	I	Fast Blank2 input	
55	RIN2 / PR	I	Analog Red2 input / PR Input	
56	GIN2 / Y	I	Analog Green2 input / Y Input	
57	BIN2/ PB	I	Analog Blue2 input / PB Input	
58	ASG2	S	Analog Shield Ground	
59	HCS	I	Half Contrast	
60	NC			
61	TEST	I		
62	RESQ	I	Reset Input, active low	
63	SCL	I/O	I2C Bus clock	
64	SDA	I/O	I2C Bus data	
65	C0	I	Picture Bus Chroma (LSB)	
66	C1	I	Picture Bus Chroma	
67	C2	I	Picture Bus Chroma	
68	C3	I	Picture Bus Chroma	
69	C4	I	Picture Bus Chroma	
70	C5	I	Picture Bus Chroma	
71	C6	I	Picture Bus Chroma	
72	C7	I	Picture Bus Chroma (MSB)	
73	VSUPD	S	Supply voltage, Digital Circuitry	
74	GNDD	S	Ground, Digital Circuitry	
75	Y0	I	Picture Bus Luma (LSB)	
76	Y1	I	Picture Bus Luma	
77	Y2	I	Picture Bus Luma	
78	Y3	I	Picture Bus Luma	
79	Y4	I	Picture Bus Luma	
80	Y5	I	Picture Bus Luma	

4.4 MSP341X MULTISTANDARD SOUND PROCESSOR

The MSP 341x is designed as a single-chip Multistandard Sound Processor for applications in analogue and digital TV sets, video recorders, and PC cards.

The MSP3411 has all functions of MSP3410 with the addition of a virtual surround sound features.
Surround sound can be reproduced to a certain extent with two loudspeakers. The MSP3411 includes virtualizer algorithm "3D Panorama" which has been approved by the Dolby laboratories for compliance with the "Virtual Dolby Surround" technology. In addition, the MSP3411 includes Micronas "Panorama" algorithm.

MSP 341x features:

- sound IF input
- No external filters required
- Stereo baseband input via integrated AD converters
- Two pairs of DA converters
- Two carrier FM or NICAM processing
- AVC : Automatic Volume Correction
- Bass, treble, volume processing
- Full SCART in/out matrix without restrictions
- Improved FM-identification
- Demodulator short programming
- Auto-detection for terrestrial TV - sound standards
- Precise bit-error rate indication
- Automatic switching from NICAM to FM/AM or vice versa
- Improved NICAM synchronisation algorithm
- Improved carrier mute algorithm
- Improved AM-demodulation
- Reduction of necessary controlling
- Less external components

4.4.1 BASIC FEATURES OF THE MSP 341X

4.4.1.1 Demodulator & NICAM Decoder Section

The MSP 341x is designed to simultaneously perform digital demodulation and decoding of NICAM-coded TV stereo sound, as well as demodulation of FM or AM mono TV sound. Alternatively, two carrier FM systems according to the German terrestrial specs can be processed with the MSP 341x.

The MSP 341x facilitates profitable multistandard capability, offering the following advantages:

- Automatic Gain Control (AGC) for analogue input: input range: 0.10 - 3 Vpp
- integrated A/D converter for sound-IF input
- all demodulation and filtering is performed on chip and is individually programmable
- easy realisation of all digital NICAM standards (B/G, I, L and D/K)
- FM-demodulation of all terrestrial standards (include identification decoding)
- no external filter hardware is required
- only one crystal clock (18.432 MHz) is necessary
- high deviation FM-mono mode (max. deviation: approx. $\pm$360 kHz)

4.4.1.2 DSP-Section (Audio Baseband Processing)

- flexible selection of audio sources to be processed
- performance of terrestrial de-emphasise systems (FM, NICAM)
- digitally performed FM-identification decoding and de-matrixing
- digital baseband processing: volume, bass, treble
- simple controlling of volume, bass, treble

4.4.1.3 Analogue Section

- two selectable analogue pairs of audio baseband input (= two SCART inputs) input level: <2 V RMS, input impedance: >25 $k\Omega$
- one selectable analogue mono input (i.e. AM sound): Not used in this chassis
- two high-quality A/D converters, S/N-Ratio: >85 dB
- 20 Hz to 20 kHz bandwidth for SCART-to-SCART copy facilities
- loudspeaker: one pair of four-fold oversampled D/A converters. Output level per channel: max. 1.4 VRMS output resistance: max. 5 kΩ. S/N-ratio: >85 dB at maximum volume max. noise voltage in mute mode: < 10 μV (BW: 20 Hz... 16 kHz)
- one pair of four-fold oversampled D/A converters supplying a pair of SCART-outputs. Output level per channel: max. 2 V RMS, output resistance: max. 0.5 kΩ, S/N-Ratio: >85 dB (20 Hz... 16 kHz)

4.4.1.4 NICAM & FM/AM-Mono

According to the British, Scandinavian, Spanish, and French TV-standards, high-quality stereo sound is transmitted digitally. The systems allow two high-quality digital sound channels to be added to the already existing FM/AM-channel. The sound coding follows the format of the socalled Near Instantaneous Companding System (NICAM 728). Transmission is performed using Differential Quadrature Phase Shift Keying (DQPSK. Table below offers an overview of the modulation parameters.

In the case of NICAM/FM (AM) mode, there are three different audio channels available: NICAM A, NICAM B, and FM/AM-mono. NICAM A and B may belong either to a stereo or to a dual language transmission. Information about operation mode and about the quality of the NICAM signal can be read by the controlling software via the control bus. In the case of low quality (high bit error rate), the controlling software may decide to switch to the analogue FM/AM-mono sound.

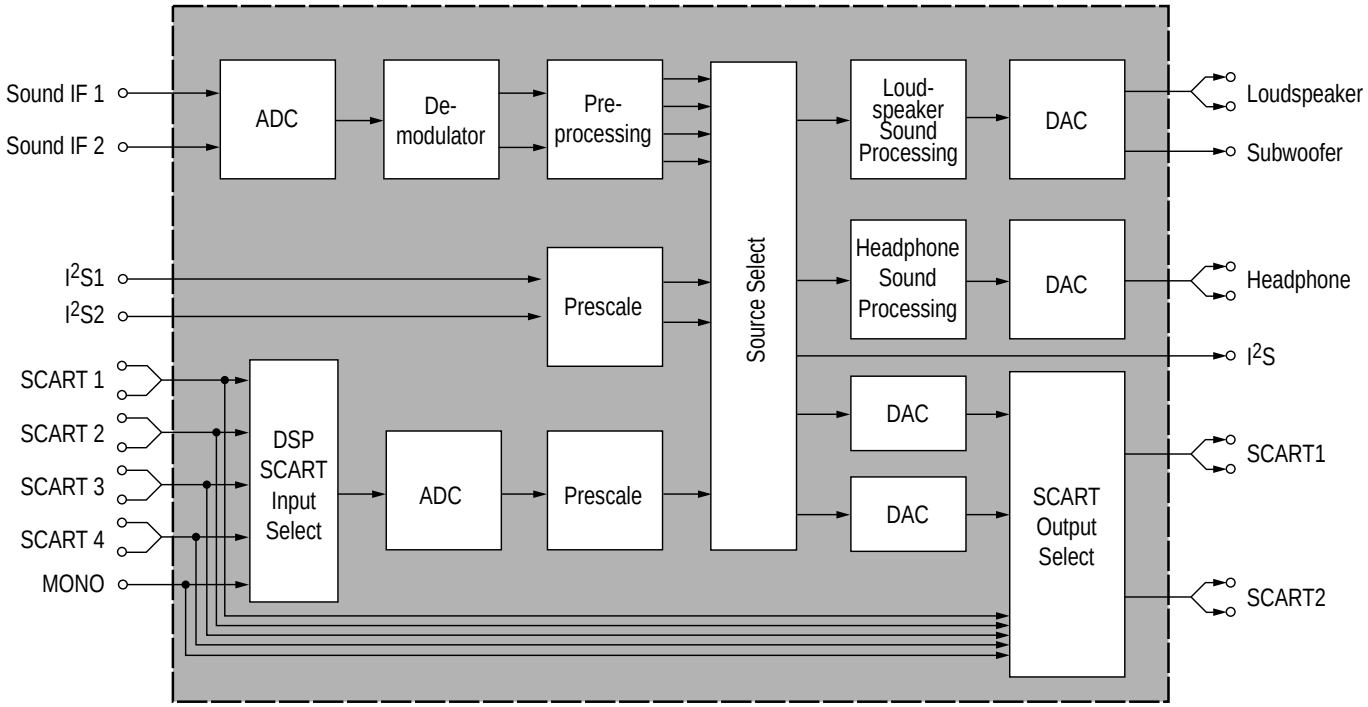
Alternatively, an automatic NICAM-FM/AM switching may be applied.

4.4.1.5 German 2-Carrier System (DUAL FM System)

Since September 1981, stereo and dual sound programs have been transmitted in Germany using the 2-carrier system. Sound transmission consists of the already existing first sound carrier and a second sound carrier additionally containing an identification signal. More details of this standard are given in Tables below. For D/K very similar system is used.

TV standards

TV system	Position of sound carrier (MHz)	Sound modulation	Colour system	Country
B/G	5.5 / 5.7421875	FM Stereo	PAL	GERMANY
B/G	5.5 / 5.85	FM-Mono / NICAM	PAL	Scandinavia,
				Spain
L	6.5 / 5.85	AM - Mono / NICAM	SECAM-L	France
I	6.0 / 6.552	FM-Mono / NICAM	PAL	UK
D/K	6.5 / 6.2578125 D/K1	FM Stereo	SECAM-	USSR
	6.5 / 6.7421875 D/K2	FM-Mono / NICAM	East	Hungary
	6.5 / 5.85 D/K-NICAM			



Architecture of MSP341x

Pin connections and short description

Pin No.	Pin Name	Type	Short description
1	NC		Not Connected
2	NC		Not Connected
3	NC		Not Connected
4	INT	Out	Interrupt out
5	MUTE	Out	Mute out
6	ADR_SEL	In	I2C bus Address select
7	STANDBYQ	In	Standby (Low-active)
8	NC		Not Connected
9	I2C_CL	In / Out	I2C Clock
10	I2C_DA	In / Out	I2C data
11	NC		Not Connected
12	NC		Not Connected
13	NC		Not Connected
14	NC		Not Connected
15	NC		Not Connected
16	NC		Not Connected
17	NC		Not Connected
18	DVSUP		Digital power supply +5V
19	DVSS		Digital Ground
20	NC		Not Connected
21	NC		Not Connected

Pin No.	Pin Name	Type	Short description
22	NC		Not Connected
23	NC		Not Connected
24	RESETQ	In	Power-On-reset
25	DACA_R	Out	Headphone out right
26	DACA_L	Out	Headphone out left
27	VREF2		Reference ground 2 high voltage part
28	DACM_R	Out	Loudspeaker out Right
29	DACM_L	Out	Loudspeaker out Left
30	NC		Not Connected
31	NC		Not Connected
32	NC		Not Connected
33	SC2_OUT_R	Out	Scart output 2 right
34	SC2_OUT_L	Out	Scart output 2 left
35	VREF1		Reference ground 1 high voltage part
36	SC1_OUT_R	Out	Scart output 1, right
37	SC1_OUT_L	Out	Scart output 1, left
38	CAPL_A		Volume capacitor AUX
39	AHVSUP		Analog power supply 8.0V
40	CAPL_M		Volume capacitor MAIN
41	AHVSS		Analog ground
42	AGNDC		Analog reference voltage high voltage part
43	NC		Not Connected
44	NC		Not Connected
45	NC		Not Connected
46	SC3_IN_L	In	Scart input 3 in, left
47	SC3_IN_R	In	Scart input 3 in, right
48	ASG2		Analog Shield Ground 2
49	SC2_IN_L	In	Scart input 2 in, left
50	SC2_IN_R	In	Scart input 2 in, right
51	ASG1		Analog Shield Ground 1
52	SC1_IN_L	In	Scart input 1 in, left
53	SC1_IN_R	In	Scart input 1 in, right
54	VREFTOP		Reference voltage IF A/D converter
55	MONO_IN	In	Mono input
56	AVSS		Analog ground
57	AVSUP		Analog power supply
58	ANA_IN1+	In	IF input 1
59	ANA_IN1-	In	IF common
60	NC		Not Connected
61	TESTEN	In	Test pin
62	XTAL_IN	In	Crystal oscillator
63	XTAL_OUT	Out	Crystal oscillator
64	NC		Test pin

4.5 TDA4470 - MULTISTANDARD VIDEO-IF AND QUASI PARALLEL SOUND PROCESSOR

4.5.1 DESCRIPTION

The TDA4470 is an integrated bipolar circuit for multi-standard video/sound IF (VIF/SIF) signal processing in TV/VCR and multimedia applications. The circuit processes all TV video IF signals with negative modulation (e.g., B/G standard), positive modulation (e.g., L standard) and the AM, FM/NICAM sound IF signals.

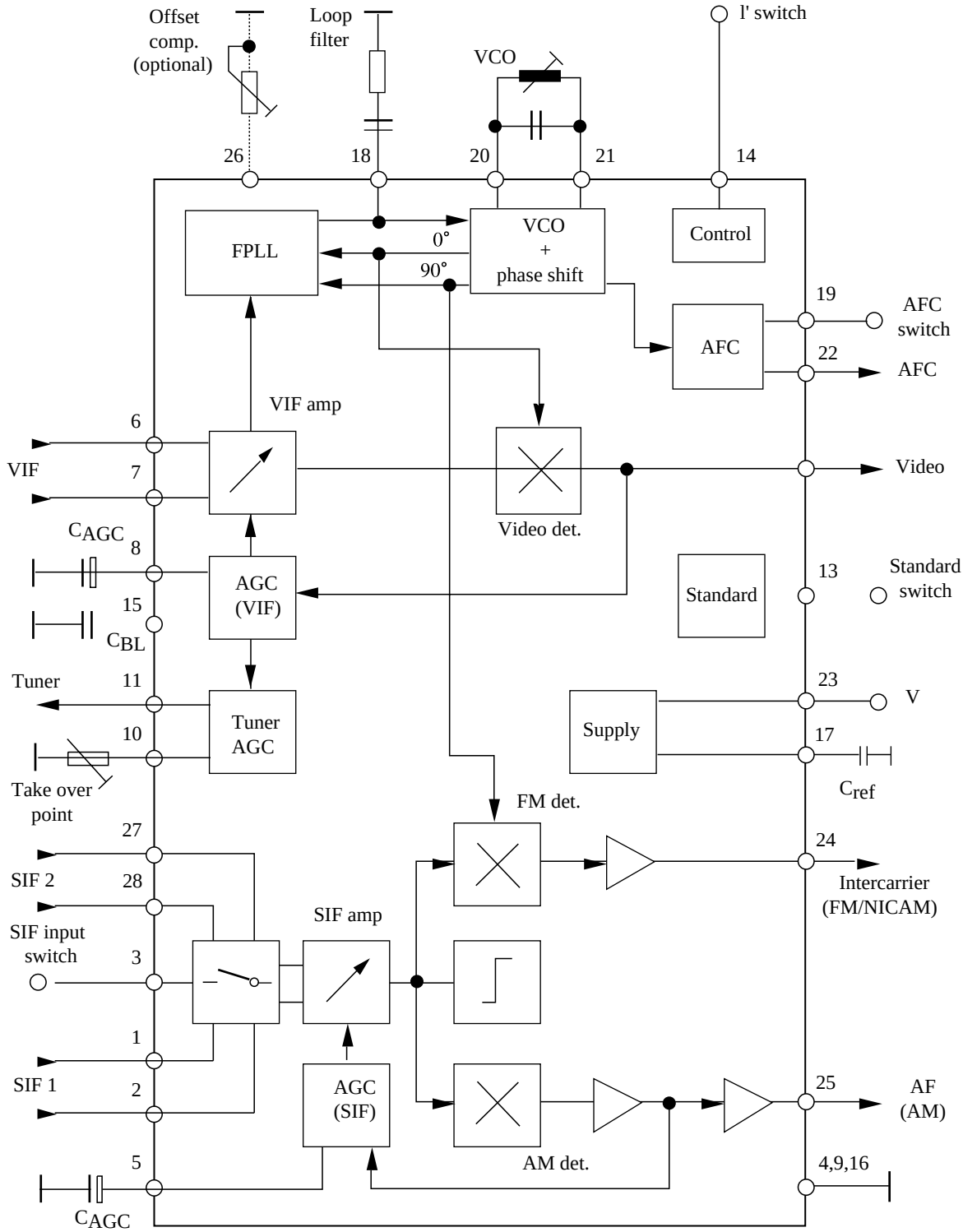
4.5.2 FEATURES

- 5 V supply voltage; low power consumption.
- Active carrier generation by FPLL principle (frequency-phase-locked-loop) for true synchronous demodulation.
- Very linear video demodulation, good pulse response and excellent intermodulation figures.
- VCO circuit operates at picture carrier frequency, the VCO frequency is switchable for L' -mode
- Alignment-free AFC without external reference circuit, polarity of the AFC curve is switchable.
- VIF-AGC for negative modulated signals (peak sync. detection) and for positive modulation (peak white/black level detector).
- Tuner AGC with adjustable take over point.
- Alignment-free quasi parallel sound (QPS) mixer for FM/NICAM sound IF signals.
- Intercarrier output signal is gain controlled (necessary for digital sound processing).
- Complete alignment-free AM demodulator with gain controlled AF output.
- Separate SIF-AGC with average detection
- Two independent SIF inputs
- Parallel operation of the AM demodulator and QPS mixer (for NICAM-L stereo sound).

4.5.3 PINNING

Pin	Symbol	Function
1, 2	Vi, SIF1	SIF1 input (symmetrical)
3	VSW	Input selector switch
4, 9, 16	GND	Ground
5	VAGC	SIF - AGC (time constant)
6, 7	Vi, VIF	VIF input (symmetrical)
8	CAGC	VIF - AGC (time constant)
10	RTOP	Take Over Point, tuner AGC
11	Itun	Tuner AGC output current
12	VO, VID	Video output
13	VSW	Standard switch
14	VSW	L' switch
15	Cbl	Black level capacitor
17	Cref	Internal reference voltage
18	LF	Loop Filter
19	VSW	AFC switch
20, 21	VVCO	VCO circuit
22	VAFC	AFC output
23	VS	Supply voltage
24	VO, FM	Intercarrier output
25	VO, AM	AF output - AM sound
26	Rcomp	Offset compensation
27, 28	Vi, SIF2	SIF2 input (symmetrical)

4.5.4 BLOCK DIAGRAM



4.6 TDA894XJ STEREO AUDIO AMPLIFIER

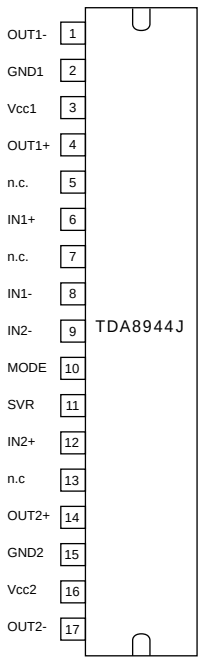
The TDA 8944J (TDA 8946J) is a dual-channel audio power amplifier with an output power of 2 x 7 W (2 x 15 W) at an 8 ? load and a 12 V supply. The circuit contains two Bridges Tied Load (BTL) amplifiers with an all-NPN output stage and standby/mute logic. The TDA8944J comes in a 17-pin DIL power package.

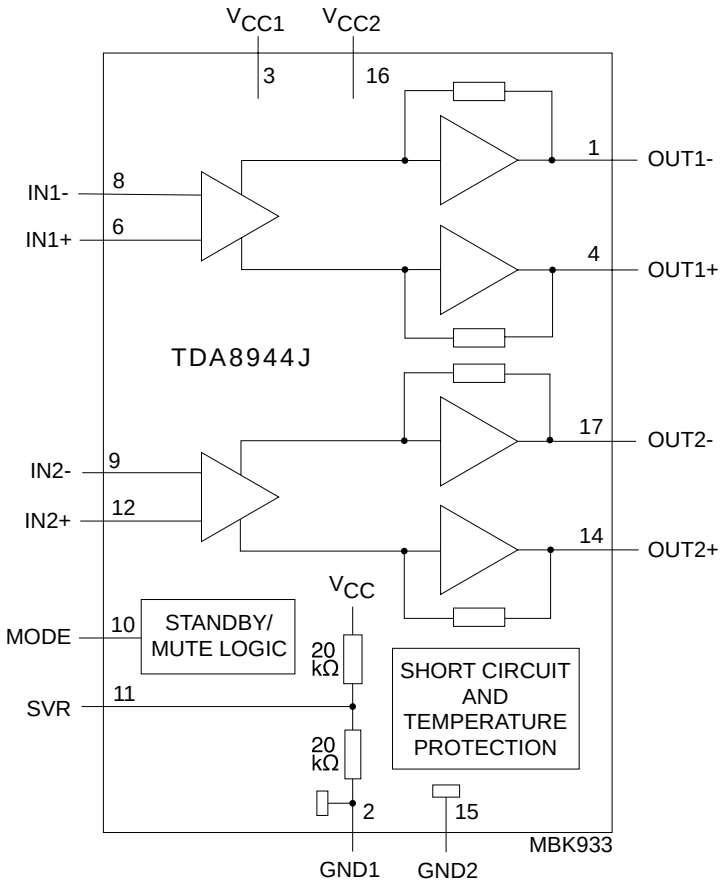
4.6.1 FEATURES

- Few external components
- Fixed gain
- Standby and mute mode
- No on/off switching plops
- low standby current
- High supply voltage ripple rejection
- Outputs short-circuit protected to ground, supply and across the load
- Thermally protected

Pin description

Pin	Symbol	Description
1	OUT1-	negative loudspeaker terminal 1
2	GND1	ground channel 1
3	Vcc1	supply voltage channel 1
4	OUT1+	positive loudspeaker terminal 1
5	n.c.	not connected
6	IN1+	positive input1
7	n.c.	not connected
8	IN1-	negative input1
9	IN2-	negative input2
10	MODE	mode selection input
11	SVR	half supply voltage decoupling (ripple rejection)
12	IN2+	positive input2





Block Diagram TDA8944J

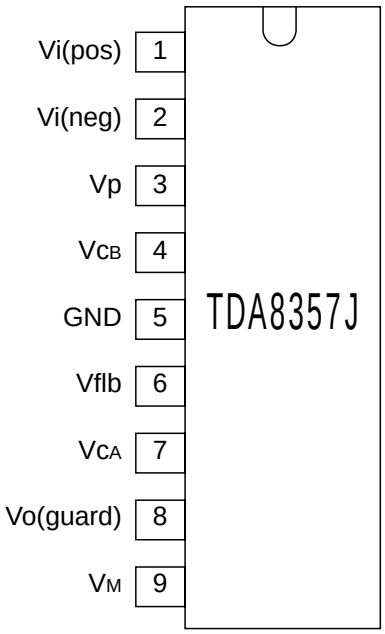
4.7 TDA835XJ VERTICAL AMPLIFIER

The TDA835xJ are power circuit for use in 90° and 110° colour deflection systems for field frequencies of 25 to 200Hz and 16/9 picture tubes. The circuit provides a DC driven vertical deflection output circuit, operating as a highly efficient class G system. Due to the full bridge output circuit the deflection coils can be DC coupled.
The IC is constructed in a Low Voltage DMOS process that combines Bipolar, CMOS and DMOS devices. MOS transistors are used in the output stage because of the absence of second breakdown.

4.7.1 TDA8357J

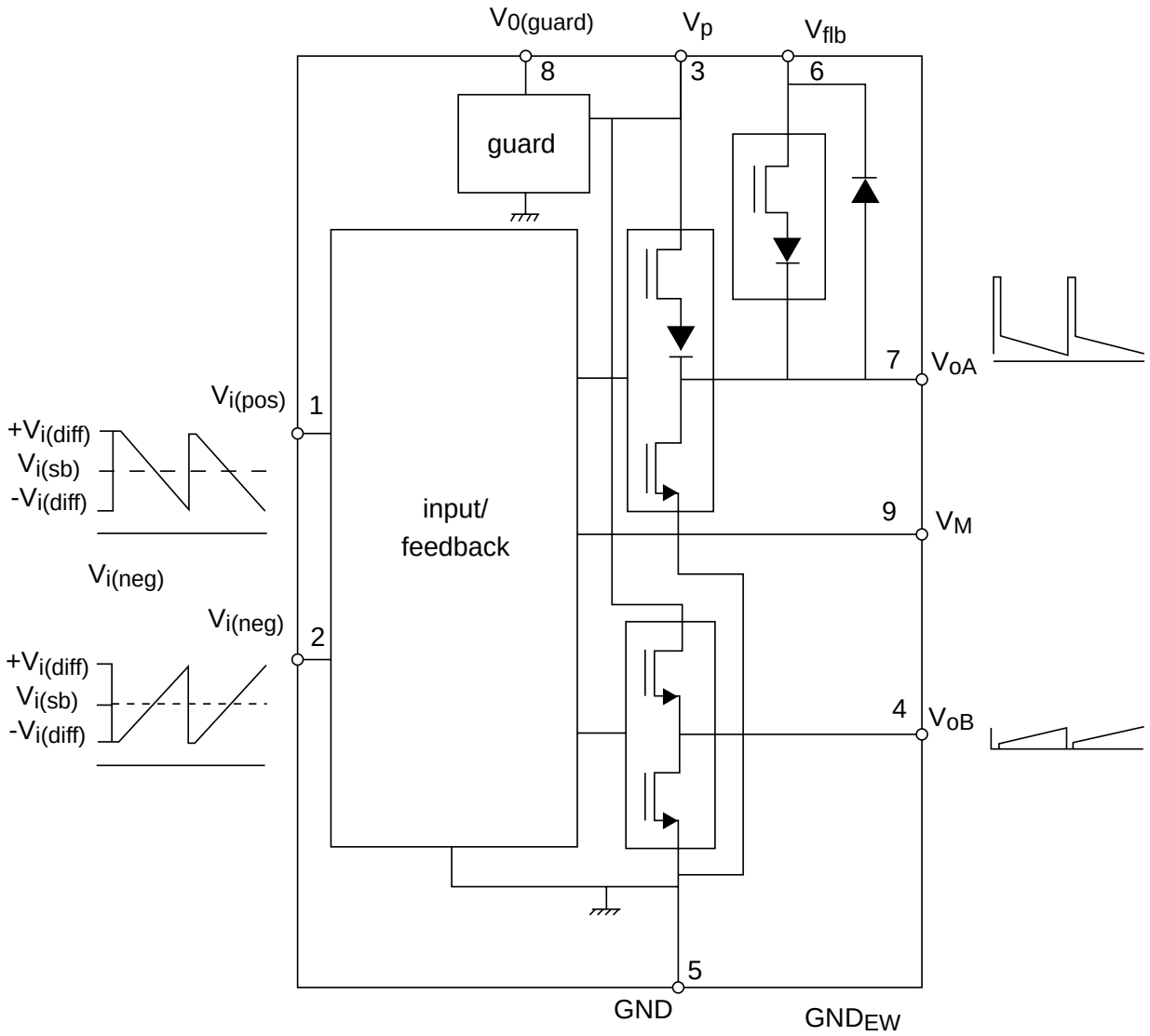
Features :

- Few external components
- Highly efficient fully DC-coupled vertical output bridge circuit
- Short rise and fall time of the vertical flyback switch
- Guard circuit
- Temperature (thermal) protection
- High EMC because of common mode inputs



Pinning

Pin	Symbol	Description
1	Vi(pos)	input voltage (positive)
2	Vi(neg)	input voltage (negative)
3	Vp	supply voltage
4	VOB	output voltage B
5	GND	ground
6	Vflb	flyback supply voltage
7	VOA	output voltage A
8	VO(guard)	guard output voltage
9	VM	input measuring resistor

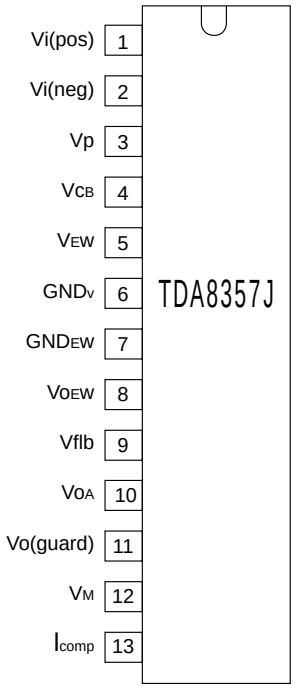


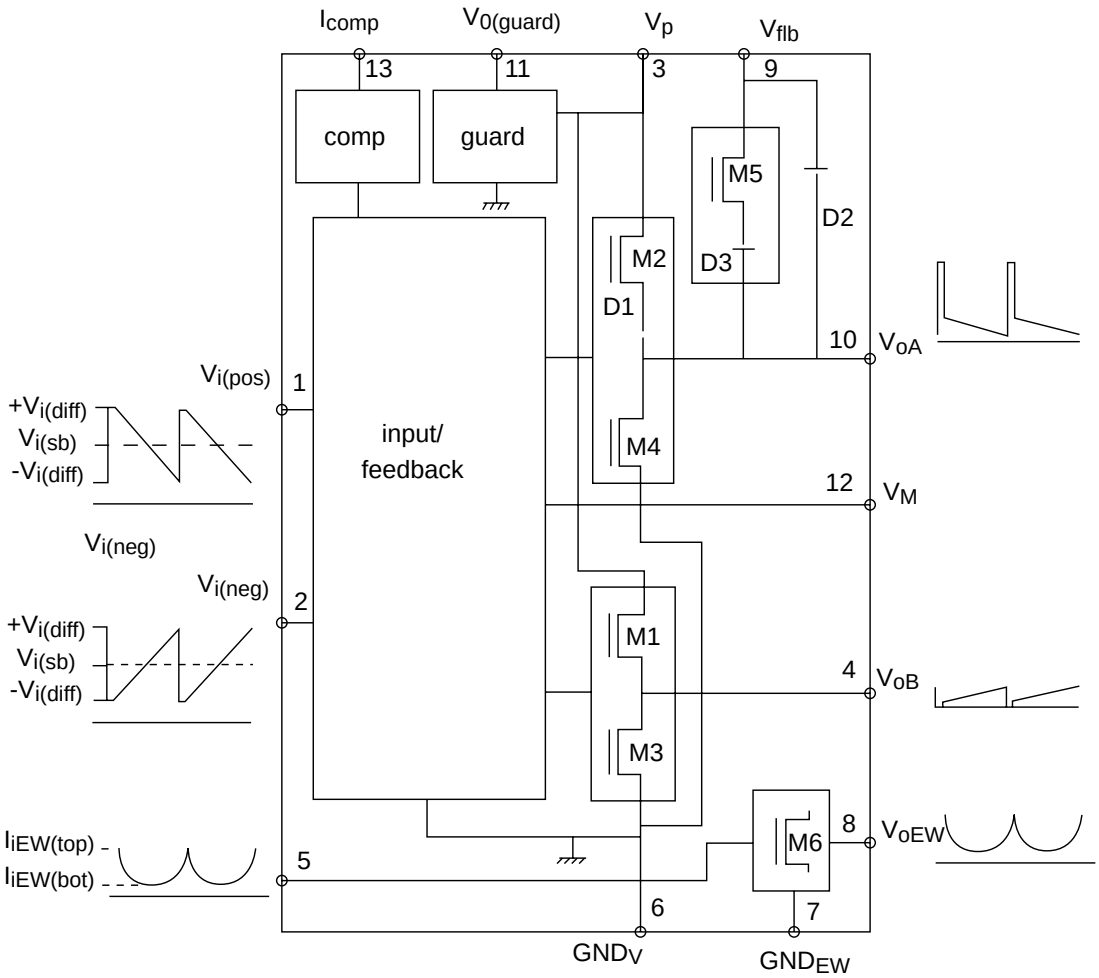
4.7.2 TDA8358J

An East-West output stage is provided that is able to sink current from the diode modulator circuit.

Features :

- Few external components
- Highly efficient fully DC-coupled vertical output bridge circuit
- Short rise and fall time of the vertical flyback switch
- Guard circuit
- Temperature (thermal) protection
- High EMC because of common mode inputs
- East-West output stage


Vi(pos) 1
Vi(neg) 2
Vp 3
VCB 4
VEW 5
GNDV 6
GNDEW 7
VOEW 8
Vflb 9
VOA 10
Vo(guard) 11
VM 12
Icomp 13
TDA8357J


Icomp
V0(guard)
Vp
Vflb
13
11
3
9
comp
guard
M5
D2
M2
D3
D1
10
VOA
Vi(pos)
1
+Vi(diff)
Vi(sb)
-Vi(diff)
input/
feedback
M4
12
VM
Vi(neg)
Vi(neg)
2
+Vi(diff)
Vi(sb)
-Vi(diff)
M1
4
VOB
M3
IiEW(top)
IiEW(bot)
M6
8
VOEW
5
6
7
GNDV
GNDEW

4.8 TDA6107Q

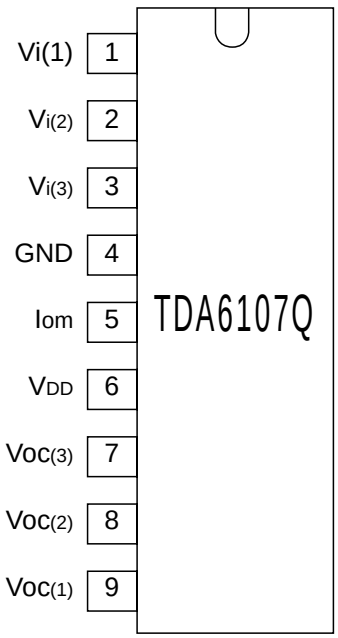
The TDA6107Q includes three video output amplifiers in one plastic DIL-Bent-SIL 9-pin medium power package, using high voltage DMOS technology, and is intended to drive the three cathodes of a colour CRT directly. To obtain maximum performance, the amplifier should be used with black-current control.

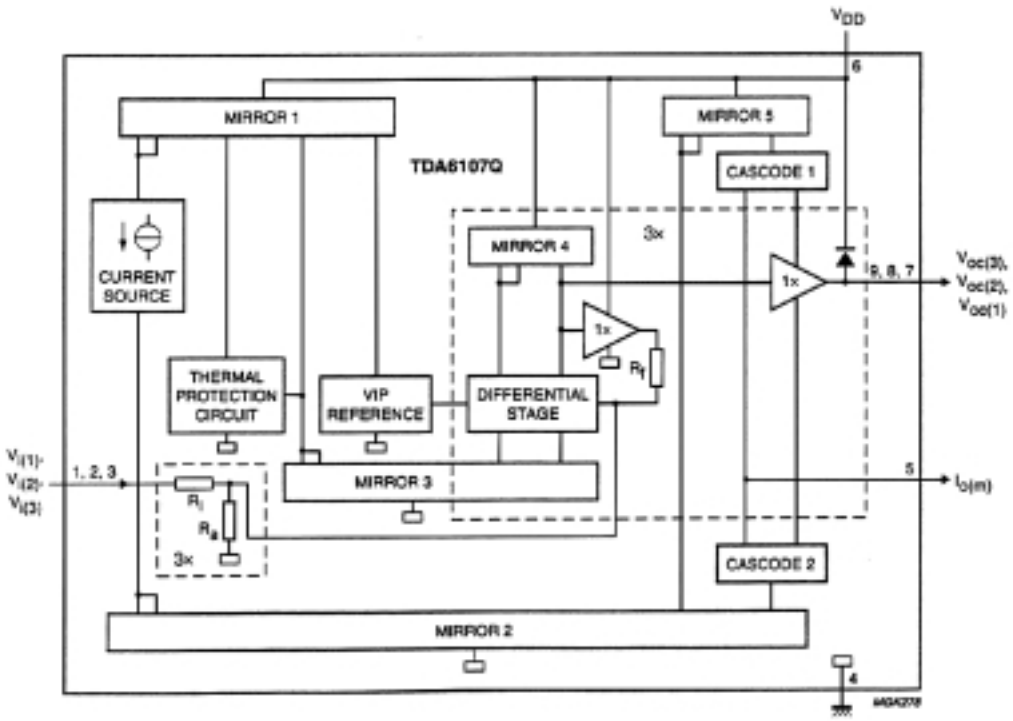
Features

- Typical bandwidth of 5.5 MHz for an output signal of 60 Vpp
- High slew rate of 900V/μs
- No external components required
- Very simple application
- Single supply voltage of 200V
- Internal reference voltage of 2.5 V
- Fixed gain of 50.
- Black-current stabilisation (BCS) circuit
- Thermal protection

Pin description

Pin	Symbol	Description
1	Vi(1)	inverting input 1
2	Vi(2)	inverting input 2
3	Vi(3)	inverting input 3
4	GND	ground (fin)
5	Iom	black current measurement output
6	VDD	supply voltage
7	VOC(3)	cathode output 3
8	VOC(2)	cathode output 2
9	VOC(1)	cathode output 1





Block diagram TDA6107Q

4.9 24C16 - 16 KB EEPROM

Features :

- 16 Kbit serial I2C bus EEPROM
- Single supply voltage : 4.5 V to 5.5 V
- 1 Million Erase/Write cycles (minimum)
- 40 year data retention (minimum)

Pin description

Pin No.	Name	Description
1, 2, 3	E0, E1, E2	Device address ? not used
5	SDA	Serial Data/Address Input/Output
6	SCL	Serial clock
7	WC	Write control
8	Vcc	Supply voltage
4	Vss	Ground

The memory device is compatible with the I2C memory standard. This is a two wire serial interface that uses a bi-directional data bus and serial clock. The memory carries a built-in 4-bit unique device type identifier code (1010) in accordance with the I2C bus definition.

Serial Clock (SCL)

The SCL input is used to strobe all data in and out of the memory.

Serial Data (SDA)

The SDA pin is bi-directional, and is used to transfer data in or out of the memory

4.10 STR - F6654

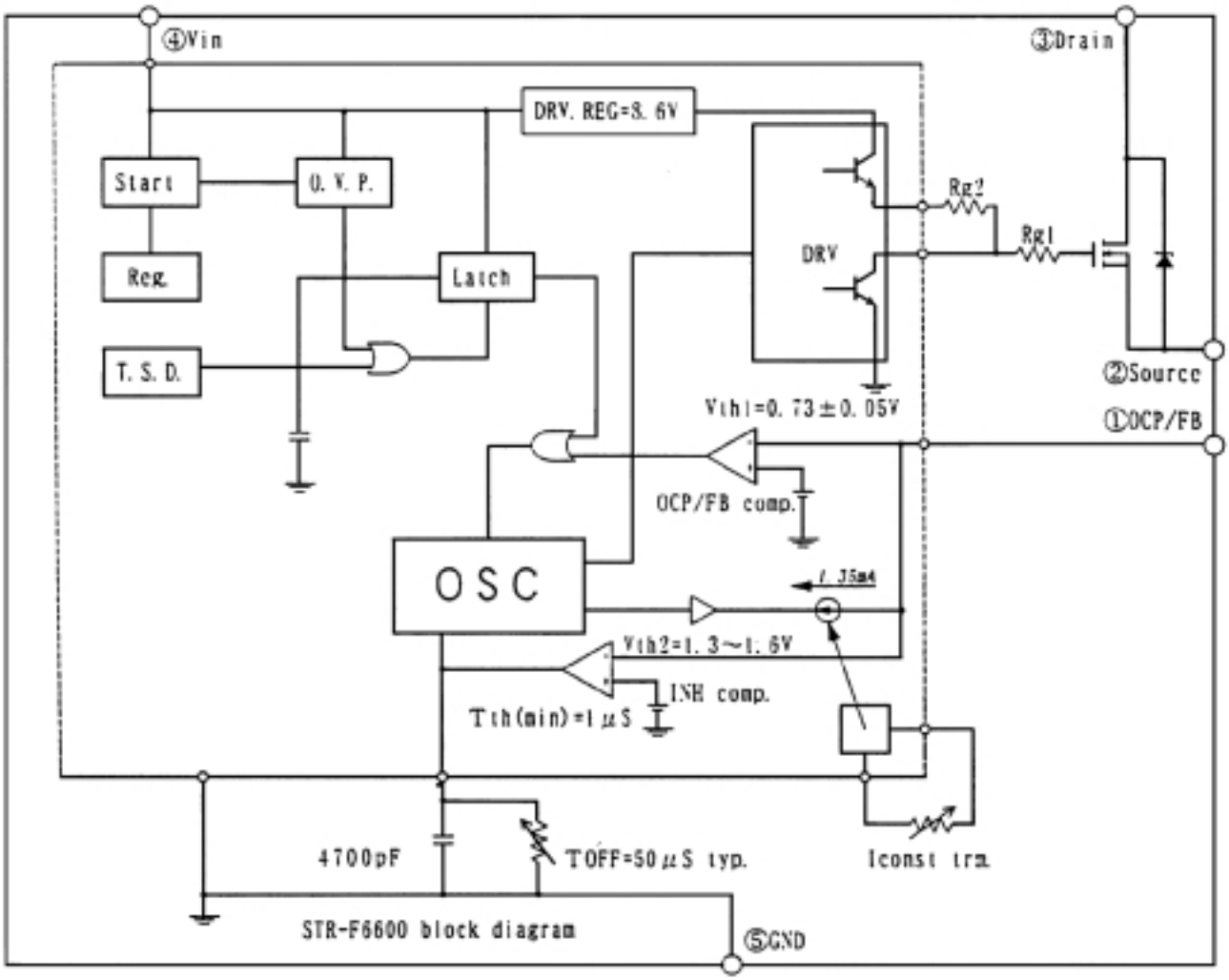
4.10.1 GENERAL DESCRIPTION

The STR-F6654 is an hybrid IC with a build-in MOSFET and control IC, designed for flyback converter type switch mode power supply applications.

4.10.2 FEATURES

- Small SIP fully isolated moulded 5 pins package
- Many protection functions :
- Pulse-by-pulse overcurrent protection (OCP)
- Overvoltage protection with latch mode (OVP)
- Thermal protection with latch mode (TSD)

4.10.3 BLOCK DIAGRAM



4.10.4 PIN DESCRIPTION

PIN	NAME	SYMBOL	DESCRIPTION
1	Overcurrent feedback	O.C. P/E.B.	Input of over current detection signal and feedback signal
2	Source	S	Mosfet source
3	Drain	D	Mosfet drain
4	Supply	VIN	Input of power supply for control circuit
5	Ground	GND	Ground

4.10.5 CONTROL PART - ELECTRICAL CHARACTERISTICS

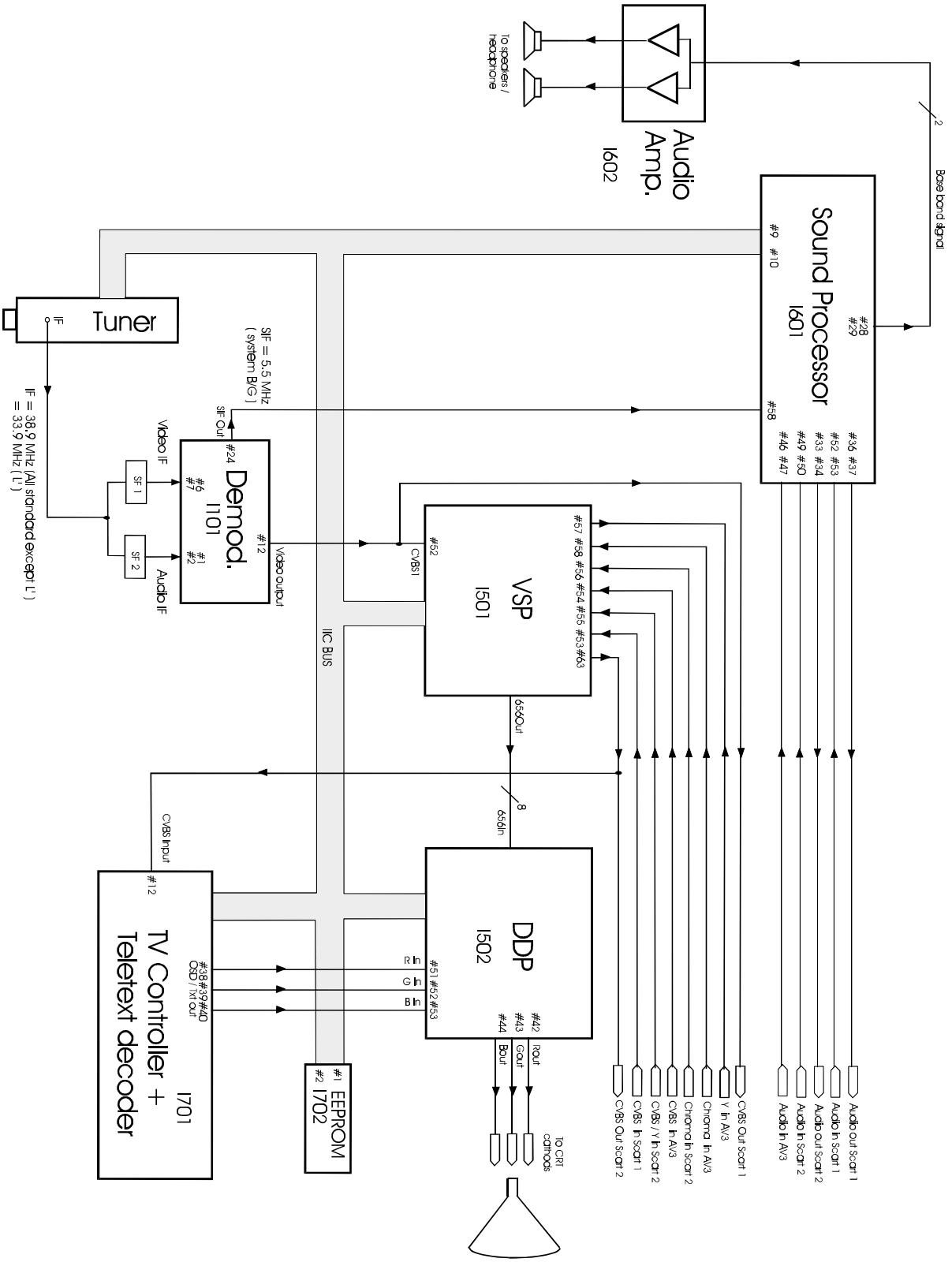
DESCRIPTION	IC PIN NUMBER	SYMBOL	RATING			UNIT
			MIN.	TYPE	MAX	
Operation start voltage	4-5	VIN (on)	14.4	16	17.6	V
Operation stop voltage	4-5	VIN (off)	9	10	111	V
Circuit current in operation	4-5	IIN (on)	-	-	30	mA
Circ. current in non-operation	4-5	IIN (off)	-	-	100	μA
Maximum off time	-	TOFF (max)	45	-	55	μSEC
Minimum time for input of quaxi resonant signals	1-5	TTH (2)	-	-	1.0	μSEC
Minimum off time	-	TOFF (min)	-	-	1.5	μSEC
O.C.P./F.B. terminal threshold voltage 1	1-5	VTH (1)	0.68	0.73	0.78	V
O.C.P./F.B. terminal threshold voltage 2	1-5	VTH (2)	1.3	1.45	1.6	V
O.C.P./F.B. terminal extraction current	1-2	IOCP/FB	1.2	1.35	1.5	mA
OVP operation voltage	4-5	VIN (OVP)	20.5	22.5	24.5	V
Latch circuit sustaining voltage	4-5	IIN (H)	-	-	400	μA
Latch circuit release voltage	4-5	VIN (Loff)	6.6	-	8.4	V
Thermal shutdown operating temperature	-	TJ (TSD)	140	-	-	0C

4.10.6 MOSFET ELECTRICAL CHARACTERISTICS

DESCRIPTION	IC PIN NUMBER	SYMBOL	MIN.	RATING TYPE	MAX	UNIT
Drain-to-source break down voltage	3-2	VDSS	650	-	-	V
Drain leakage current	3-2	IDSS	-	-	300	μA
On-resistance	3-2	RDS (on)	-	-	1.95	Ω
Switching time	3-2	tf	-	-	250	noec
Thermal resistance	-	OCH - F	-	-	0.95	0C/W

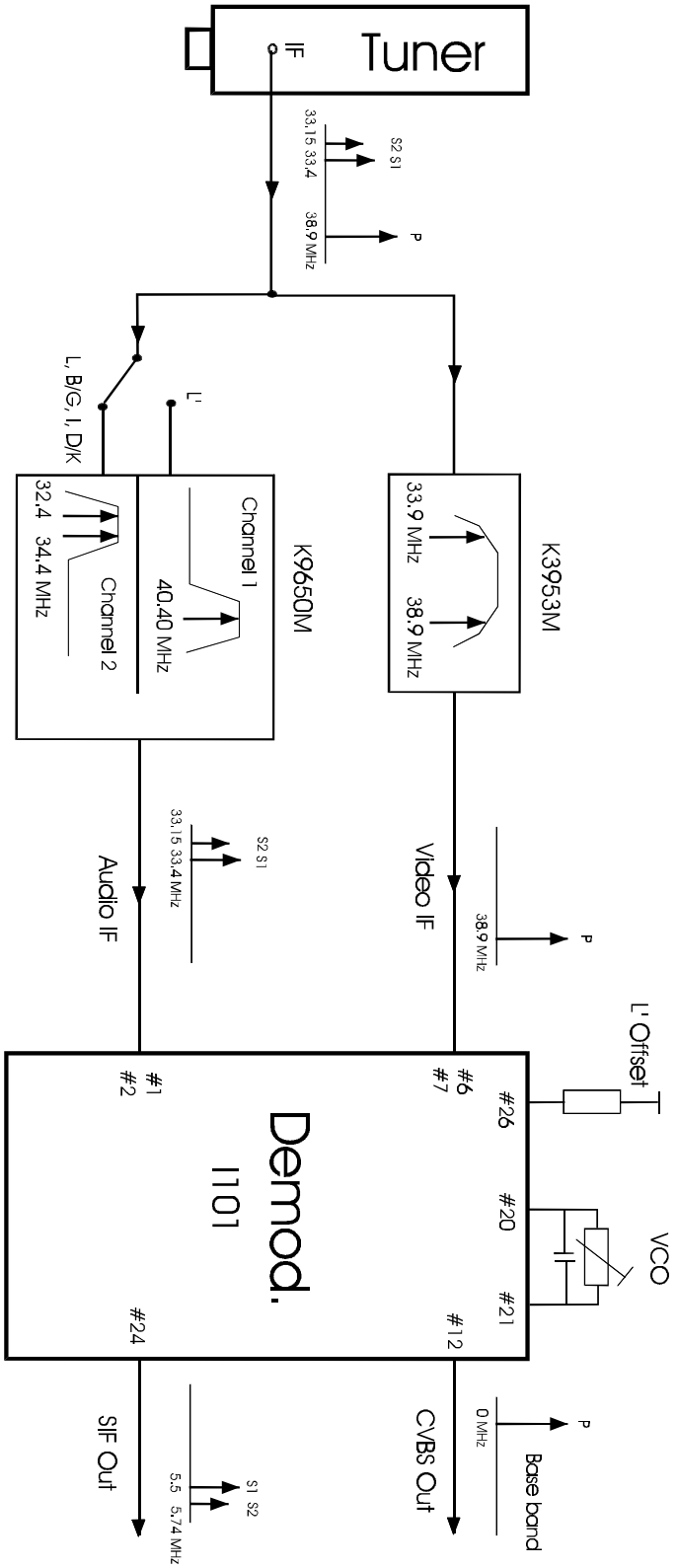
5 CP830 CHASSIS DESCRIPTION

5.1 BLOCK DIAGRAM



5.2 IF SECTION

5.2.1 BLOCK DIAGRAM



5.2.2 VISION IF AMPLIFIER

The video IF signal (VIF) is fed through a SAW filter to the differential input (Pin 6-7) of the VIF amplifier. This amplifier consists of three AC-coupled amplifier stages. Each differential amplifier is gain controlled by the automatic gain control (VIF-AGC). The output signal of the VIF amplifier is applied to the FPLL carrier generation and the video demodulator.

SAW filters

Ref.	Standard	Features
K3953M	B/G - D/K - I - L/L'	■ IF filter for video application ■ TV IF filter with Nyquist slopes at 33.9 MHz and 38.9 MHz ■ Constant group delay
K9650M	B/G - D/K - I - L/L'	■ IF filter for audio application ■ TV IF audio filter with two channels ■ Channel 1 (L') with one pass band for sound carrier at 40.40 MHz ■ Channel 2 (L, D/K, I, B/G) with one pass band for sound carriers between 32.40 MHz and 33.40 MHz

5.2.3 TUNER-AND VIF-AGC

At Pin 8, the VIF-AGC charges/discharges the AGC capacitor to generate a control voltage for setting the gain of the VIF amplifier and tuner in order to keep the video output signal at a constant level. Therefore, in the case of all negative modulated signals (e.g., B/G standard) the sync. level of the demodulated video signal is the criterion for a fast charge/discharge of the AGC capacitor. For positive modulation (e.g., L standard) the peak white level of video signal controls the charge current. In order to reduce reaction time for positive modulation, where a large time constant is needed, an additional black level detector controls the discharge current in the event of decreasing VIF input signal. The control voltage (AGC voltage at Pin 8) is transferred to an internal control signal, and is fed to the tuner AGC to generate the tuner AGC current at Pin 11 (open collector output). The take over point of the tuner AGC is adjusted at Pin 10 by an external dc voltage from microprocessor. A PWM output from microcontroller is low pass filtered for this AGC control. See also "AGC" adjustment for details on how to align TOP in SERVICE mode.

5.2.4 FPLL, VCO AND AFC

The FPLL circuit (frequency phase locked loop) consists of a frequency and phase detector to generate the control voltage for the VCO tuning. In the locked mode, the VCO is controlled by the phase detector and in unlocked mode, the frequency detector is superimposed. The VCO operates with an external resonance circuit (L and C parallel) and is controlled by internal varicaps. The VCO control voltage is also converted to a current and represents the AFC output signal at Pin 22. At the AFC switch (Pin 19) three operating conditions of the AFC are possible: AFC curve "rising" or "falling" and AFC "off". A practicable VCO alignment of the external coil is the adjustment to zero AFC output current at Pin 22. At center frequency the AFC output current is equal to zero. Furthermore, at Pin 14, the VCO center frequency can be switched for setting to the required L' value (L' standard). The optional potentiometer at Pin 26 allows an offset compensation of the VCO phase for improved sound quality (fine adjustment). Without a potentiometer (open circuit at Pin 26), this offset compensation is not active. The oscillator signal passes a phase shifter and supplies the in-phase signal (?°) and the quadrature signal (9?°)of the generated picture carrier.

5.2.5 VIDEO DEMODULATION AND AMPLIFIER

The video IF signal, which is applied from the gain controlled IF amplifier, is multiplied with the inphase component of the VCO signal. The video demodulator is designed for low distortion and large bandwidth. The demodulator output signal passes an integrated low pass filter for attenuation of the residual vision carrier and is fed to the video amplifier. The video amplifier is realised by an operational amplifier with internal feedback and 8 MHz bandwidth (?3 dB). A standard dependent dc level shift in this stage delivers the same sync. level for positive and negative modulation. An additional noise clipping is provided. The video signal is fed to VIF-AGC and to the video output buffer. This amplifier with a 6 dB gain offers easy adaptation of the sound trap. For nominal video IF modulation the video output signal at Pin 12 is 2 Vpp.

5.2.6 SOUND IF AMPLIFIER AND SIF-AGC

The SIF amplifier is nearly identical with the 3-stage VIF amplifier. Only the first amplifier stage exists twice and is switchable by a control voltage at Pin 3. Therefore with a minimal external expense it is possible to switch between two different SAW filters. Both SIF inputs features excellent cross-talk attenuation and an input impedance which is independent from the switching condition. The SIF-AGC is related to the average level of AM- or FM-carrier and controls the SIF amplifier to provide a constant SIF signal to the AM demodulator and QPS mixer.

5.2.7 QUASI-PARALLEL-SOUND (QPS) MIXER

The QPS mixer is realised by a multiplier. The SIF signal (FM or NICAM carrier) is converted to the intercarrier frequency by the regenerated picture carrier (quadrature signal) which is provided from the VCO. The intercarrier signal is fed via an output amplifier to Pin 24.

5.2.8 STANDARD SWITCH

To have equal polarity of the video output signal the polarity can be switched in the demodulation stage in accordance with the TV standard. Additional a standard dependent dc level shift in the video amplifier delivers the same sync. level. In parallel to this, the correct VIF-AGC is selected for positive or negative modulated VIF signals. In the case of negative modulation (e.g., B/G standard) the AM output signal is switched off. For positive modulation (L standard) the AM demodulator and QPS mixer is active. This condition allows a parallel operation of the AM sound signal and the NICAM-L stereo sound.

5.2.9 L' SWITCH

With a control voltage at Pin 14 the VCO frequency can be switched for setting to the required L' value (L' standard). Also a fine adjustment of the L'-VCO center frequency is possible via a potentiometer. The L' switch is only active for positive modulated video IF-signals (standard switch in L mode).

5.2.10 INTERNAL VOLTAGE STABILISER

The internal bandgap reference ensures constant performance independent of supply voltage and temperature.

5.3 VIDEO / RGB

5.3.1 FRONT END

5.3.1.1 CVBS Front-End

The CVBS front-end consists of the colour-decoding circuit itself, a sync processing circuit for generation of H/V signals out of the CVBS signal, and the luminance processing. The main task of the luminance processing is to remove the colour carrier by means of a notch filter. For PAL and SECAM operation a baseband delay line is used for U and V signals. This can be used as comb filter in NTSC operation (only for chrominance). The RGB input from SCART is used

as an overlay for the CVBS channel (RGB+FBL).
This block contains a matrix (for RGB signals).

5.3.1.2 Input Selector
The analog CVBS or SVHS luma signal are fed to the inputs CVBS1...7 of VSP94x2A (amplitude 0.5...1.5 V pp). One signal is selected and fed to the first ADC. A second signal (SVHS Chroma) can be selected and fed to the other ADC. After clamping to the back porch both signals are AD-converted with an amplitude resolution of 9 bit. The AD conversion is done using a 20.25 MHz free-running stable crystal clock. Before the A to D conversion the signals are lowpass filtered to avoid antialias effects. One input is looped back to output CVBSO1(#63). A signal addition is performed to output a CVBS signal even when separate Y/C signals are used at input.

5.3.1.3 Signal Levels And Gain Control To adjust to different CVBS input voltages a digitally working automatic gain control is implemented. Input voltages in the range between 0.6 to 1.8 V pp can be applied to the CVBS inputs.

5.3.1.4 Synchronization
After elimination of the high frequent components of the CVBS signal by a low pass filter, horizontal and vertical sync pulses are separated. Horizontal sync pulses are generated by a digital phase locked loop. The time constant is adjusted between fast and slow behaviour to accommodate different input sources (e.g. VCR).

5.3.1.5 Chroma Decoder
The digital multistandard chroma decoder is able to decode NTSC and PAL signals with a subcarrier frequency of 3.58 MHz and 4.43 MHz as well as SECAM signals with automatic standard detection. The TV controller software has configured the colour decoder to operate in automatic detection mode. When the signal source comes from the tuner, only SECAM and PAL (50Hz) standard are enabled. In AV mode or when program number 0 is selected the following standards are also enabled : NTSC M, NTSC 4.43 and PAL 60. The demodulation is done with a regenerated colour-carrier.

5.3.1.6 Luminance Processing
A luminance notch filter is implemented to separate the chroma information from the luminance. Depending on the colour standard, one out of three different notch characteristics is chosen ('PAL' , 'NTSC' , 'SECAM') automatically.

5.3.1.7 RGB Front-End
An analogue RGB input port for an external RGB source is available. The incoming signal is clamped to the back porch by a clamping pulse. This input as an overlay input (soft mix). The RGB signal must then be synchronised to the main CVBS/YC signal.

5.3.1.8 Signal Processing
5.3.1.8.1 Horizontal Prescaler
The main application of the horizontal prescaler is the conversion of the number of pixels coming form the 40.5/20.25 MHz pixel clock domain down to the number of pixels stored in the memory (factor 2/3). Generally the number of incoming pixels can be decimated by a factor between 1 and 64 in a granularity of 2 output pixels. The horizontal scaler reduces the number of incoming pixels by subsampling. To prevent the introduction of alias distortion low pass filters are used for luminance and chrominance processing. The horizontal prescaler consists of two main subsampling stages. The first stage is a scaler for rational decimation factors in a range of 1 to 2. The second stage decimates in integer steps (1,2,3,4...32).

5.3.1.8.2 Noise Reduction

The structure of the temporal motion adaptive noise reduction is the same for luminance as for chrominance signal.
The output of the motion detector is weighted. The look-up table input value range is separated into 8 segments. It is possible to freely program different behaviour of the noise reduction by using predefined curve characteristic for each segment.

5.3.1.8.3 Noise Measurement

The noise measurement algorithm is used to sort program during ATSS. This is done by the TV- microcontroller which reads the noise level in VSP. The value is determined by averaging over several fields.

5.3.1.8.4 Operation Modes

The interlaced input signal (e.g. 50 Hz PAL or 60 Hz NTSC) is composed of a field A (odd lines) and a field B (even lines). The 100Hz operation mode used is simply AABB, where each stored field in the memory is displayed double times on the TV screen. A still field can be displayed using FREEZE command, the operation mode becomes ABAB.

5.3.1.8.5 Digital 656 Output

The output data format corresponds to CCIR 656 with double-scan format (8-bit bus at a data rate of 54 MHz). There all frequencies and data-rates are doubled compared to standard CCIR656 specification. Timing reference codes (SAV, EAV) are inserted according to the specification. The output is set to 720 pixels per line and the display clock is set to 54 MHz.

5.3.2 BACK END

5.3.2.1 Digital Input Interface

The digital input interface is set to receive 8 bit 4:2:2 Y Cr Cb multiplexed with separate H/V-syncs and clock (ITU-R-656 format). The data inputs Y0...Y7 and C0...C7 are clocked with the external clock LLC2. The clock frequency is 54 MHz for 8 bit data input. The horizontal sync pulse at the HS pin should be an active video signal, which is not vertically blanked. A clock generator converts the different external line locked clock rates to a common internal sample rate of approximately 40.5 MHz, in order to provide a fix bandwidth for all digital filters. Therefore the input data is sample rate converted to the common processing frequency by the horizontal scaler.

5.3.2.2 Horizontal Scaler

The horizontal scaler supports linear or nonlinear horizontal scaling of the digital input video signal in the range of 0.25 to 4. Nonlinear scaling, also called "panorama vision", provides a geometrical distortion of the input picture. It is used to fit a picture with 4:3 format on a 16:9 screen by stretching the picture geometry at the borders. Also, the inverse effect can be produced by the scaler. See also microcontroller section to find details on format switching logic.

5.3.2.3 Luma Contrast and Brightness

The luminance signal is multiplied by a factor of 0...2 (contrast adjustment). The signal can be shifted by $\pm$100% of its maximal amplitude with the digital brightness value

5.3.2.4 Black Level Expander/Compressor (BLEC)

The black level expander/compressor modifies the luminance signal with an adjustable non-linear function to enhance the contrast of the picture.Dark areas are stretched to black, while bright areas remain unchanged. Advantageously, this black level processing is performed dynamically and only if it will be most noticeable to the viewer.

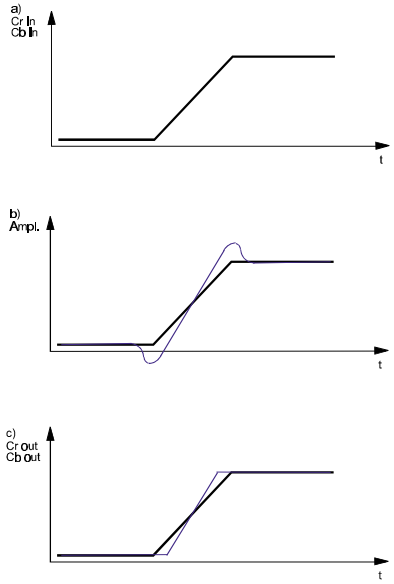
5.3.2.5 Luma Sharpness Enhancer (LSE)
Sharpness is one of the most critical features for optimum picture quality. This important processing is performed in the LSE circuitry of DDP 3315C. It consists of the dynamic peaking, the luma transient improvement (LTI) and an adaptive mixer. The luma input signal is processed in the peaking and LTI block in parallel. Both output signals are combined in the mixer depending on the selected LSE characteristic.

5.3.2.6 Dynamic Peaking
The dynamic peaking improves the details of a picture by contour emphasis. It adapts to the amplitude and the frequency of the input signal. Small detail amplitudes are sharpened, while large detail amplitudes stay nearly unmodified.

5.3.2.7 Luma Transient Improvement (LTI)
For small detail amplitudes the dynamic peaking is the most appropriate processing to improve the sharpness. However, for large amplitudes even small over-and/ or undershoots of the peaking are too annoying. The luma transient improvement enhances the slope of picture detail without these effects by a non-linear processing. The contour correction signal calculated in this block, is limited to the adjacent extreme values to prevent over- and undershoots. The LTI features an adjustable gain control and an adjustable coring threshold to prevent the enhancement of small noise amplitudes.

5.3.2.8 Mixing of Dynamic Peaking and LTI
The contour correction signals of the dynamic peaking and the LTI block are combined by the mixer. Controlled by the amplitude of a picture edge, this circuitry fades between these two signals. Thus, small and medium picture detail is enhanced by contour emphasis (peaking) and large picture detail is enhanced by step-improvement (LTI).

5.3.2.9 Chroma Transient Improvement
The intention of this block is to enhance the chroma resolution. A correction signal is calculated by differentiation of the colour difference signals. The differentiation can be selected according to the signal bandwidth, e.g. for PAL/NTSC/SECAM or digital component signals, respectively. The amplitude of the correction signal is adjustable. Small noise amplitudes in the correction signal are suppressed by an adjustable coring circuit. To eliminate "wrong colours", which are caused by over and undershoots at the chroma transition, the sharpened chroma signals are limited to a proper value automatically.



a) Cr Cb input of CTI
b) Cr Cb input + correction signal
c) sharpened and limited Cr Cb

5.3.2.10 Analog Back End

The digital RGB signals are converted to analogue RGB by three 10-bit digital to analogue converters (DAC). Each RGB signal has two additional DACs with 9-bit resolution to adjust analogue brightness (40% of the full RGB range) and cutoff / black level (60% of the full RGB range). An additional fixed current is applied for the blanking level.
The back-end supports the insertion of two external analogue component signals, only one is used for OSD/Text from the microcontroller. These signals are clamped, processed in an analogue matrix (RGB2), converted by a voltage/current converter (VCC), and inserted into the main RGB by the fast blank switch. The analogue RGB outputs are current outputs with current- sink characteristics.

5.3.2.11 Analog RGB Insertion

Each component signal is clamped, converted to RGB if required, and inserted into the main RGB by the fast blank switch. The external component signals are adjustable independently as regards DC level (brightness) and magnitude (contrast). Fast Blank selection logic Over-/underlay of the external component signal and the main RGB signal depends on the fast blank input signal.

5.3.2.12 CRT Measurement and Control

In order to define accurate colour on different CRT displays, the cut-off and white drive settings are adjusted in factory depending on the characteristic of CRT phosphor.To guarantee correct colours during the lifetime of the display, a build in automatic tube control loop measures and adjusts the black level on every field and white point every third field. The display processor is equipped with an 9/12-bit PDM-ADC for all picture tube measuring purposes. This MADC is connected to the SENSE input pin, the input range is 0 to 2.6 V. Cutoff and white drive current measurement are carried out with 8-bit resolution during the vertical blanking interval. The current range for cutoff measurement is set by connecting the sense resistor RC591 to the SENSE input. Due to the fact of a 1:10 relation between cutoff and white drive current the range select 2 output (RSW2) becomes active for the white drive measurement and connects R533 in parallel to RC591, thus determining the correct current range. During the active picture, the MADC is used for the average beam current limiter with a 12-bit resolution. Again a different measurement range is selected with active range select 1&2 outputs (RSW1&RSW2) connecting R534 in parallel to R533 and RC591. These measurements are typically done at the summation point of the picture tube cathode currents.

The picture tube measurement returns results on
every field for:
- cutoff R
- cutoff G
- cutoff B
- white drive R or G or B (sequentially)

The average beam current limiter (BCL) works on both the digital YC r C b input from VSP and the inserted analog RGB signals (OSD and Teletext) by using the sense input for the beam current measurement. The BCL uses a different filter to average the beam current during the active picture resulting in a 12-bit resolution. The filter bandwidth is approximately 4 kHz. The beam current limiter allows the setting of a threshold current, a gain and an additional time constant. To accommodate several CRT's, beam current threshold and gain can be modified by microcontroller option2. If the beam current is above the threshold, the excess current is low-pass filtered with the according gain and time constant. The result is used to attenuate the RGB outputs by adjusting the white drive multipliers for the internal (digital) RGB signals, and the analog contrast multipliers for the analog RGB inputs, respectively. The lower limit of the attenuator is programmable, thus a minimum contrast can always be set. If the minimum contrast is reached, the brightness will be decreased to a programmable minimum as well.

5.3.2.13 Synchronization and Deflection

The deflection processing generates the signals for the horizontal and vertical drive. This block contains two numeric phase-locked loops and a security unit:
- PLL2 generates the horizontal and vertical timing, e.g. blanking, clamping and sync signals.
  Phase and frequency are synchronised by the incoming sync signals.
- PLL3 adjusts the phase of the horizontal drive pulse and compensates for the delay of the horizontal output stage.
- The security unit observes the H-Drive output signal.
  With an external 5 MHz reference clock this unit controls the H-drive "off time" and period. In case of an incorrect H-drive signal the security unit generates a free running h-drive signal divided down from beam current

5.3.2.14 EHT Compensation

The vertical deflection waveform is scaled according the average beam current. This is used to compensate the effects of electric high tension changes due to beam current variations. EHT compensation for East/West deflection is done with an offset corresponding to the average beam current.

5.4 MICRONTROLLER

5.4.1 MICROCONTROLLER FEATURES

- 8-bit 8051 instruction set compatible CPU
- 33.33-MHz internal clock (max.)
- 0.360 μs (min.) instruction cycle
- Two 16-bit timers : schedule software tasks , and user clock
- Watchdog timer
- Capture compare timer for infrared remote control decoding
- Pulse width modulation unit (2 channels 14 bit, 6 channels 8 bit) : used to control AGC Take Over Point .
- ADC (4 channels, 8 bit) : AFT, AGC, Local keys, OCP.
- UART

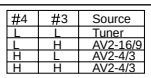
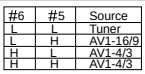
5.4.2 ACQUISITION FEATURES

- Multistandard Digital Data Slicer
- Parallel Multi-norm Slicing (TTX, VPS, WSS)
- Four Different Framing Codes Available
- Data Caption only Limited by available Memory
- Programmable VBI-buffer
- Full Channel Data Slicing Supported
- Fully Digital Signal Processing
- Noise Measurement and Controlled Noise Compensation
- Attenuation Measurement and Compensation
- Group Delay Measurement and Compensation
- Exact Decoding of Echo Disturbed Signals

5.4.3 PORTS

- One 8-bit I/O-port with open drain output and optional I 2 C Bus emulation support (Port 0)
- Two 8-bit multifunction I/O-ports (Port 1, Port 3)
- One 4-bit port working as digital or analogue inputs for the ADC (Port 2)
- One 2-bit I/O-port with secondary functions (P4.2, 4.3, 4.7)

5.4.4 μCONTROLLER I/O PIN CONFIGURATION AND FUNCTION TABLE

PIN	NAME	CONFIGURATION		DESCRIPTION
		STAND BY	TV ON	
3	S/SW2	Open Drain	Open Drain	
4	S/SW2	Open Drain	Open Drain	
5	S/SW1	Open Drain	Open Drain	
6	S/SW1	Open Drain	Open Drain	
8	RESET out	Low	Open Drain	Reset video IC's
15	AFT	High impedance	High impedance	AFT input? ADC input
16	AGC in	High impedance	High impedance	AGC input ? ADC input
17	KEY	High impedance	High impedance	Keyboard input ? ADC input
18	OCP	High impedance	High impedance	Over Current Protection ? Switch
21	Mod SW	High impedance	Push Pull	High = Negative modulation, Low = Positive modulation (L/L').
22	SECAM L'	High impedance	Push Pull	Low = L, High =L'
23	IR	High impedance	High impedance	Infrared Interrupt input
24	SOUND INTInput	input	Sound interrupt input-edge	triggered
48	AGC out	--	PWM out	Control tuner AGC (TOP)
51	LED	Push Pull	Push Pull	Low : LED Red High : LED Green
52	Power	Push Pull - Low	Push Pull - High	SMPS operation mode (Burst/ ON)

5.4.5 TUNING

The AFC information is supplied by the demodulator IC, and becomes available on SDA55xx pin 15 for controlling software. The controlling software uses this information for tuner frequency tracking (automatic following). The AFC windows is typically between 50 KHz and 100 KHz. The minimum frequency step of the tuner is 50 Khz. This AFC function is disabled when a program is tuned using the direct frequency entry or after fine tuning adjustment. Therefore it is recommended to tune channel with the TV search function (manual or ATSS) or using the direct channel entry to enable the Automatic Frequency Control.

5.4.6 AUTOMATIC PICTURE FORMAT SWITCHING When AUTO mode is selected by the user, the television will automatically select the picture format for the user. If the user does not want to accept this selected format, he can always override the setting by use of the ZOOM control on the remote control.

The received information used for automatic picture format control (only while AUTO is selected)
is supplied from two sources;

- y WSS data (Wide Screen Signalling Information : see the WSS European Telecommunication Standard ETS 300 294).
- The voltage level from SCART 1 or SCART 2, pin 8 (slow switching)

5.4.6.1 WSS Data

This digital signal is a received at the beginning of line 23 in each frame. It is not a teletext signal, but the controller uses the same decoder resources to receive and decode the digital signal.
This is bi-phase encoded using a clock frequency of 5 MHz. In total, 14 data bits are available, in 4 groups.

- Group 1 : Aspect Ratio (b0, b1, b2, b3)
- Group 2 : Enhanced Services (b4, b5, b6, b7)
- Group 3 : Subtitles (b8, b9, b10)
- Group 4 : Reserved (b11, b12, b13)

The signal contains bits in Data Group 1 which define an Aspect Ratio label, and in Data Group 3
(b10) which defines if subtitles are available in the video. The other data groups have no
application in this TV for picture format selection.
The TV decoder recognises 5 bits of data (where b3 is an odd parity bit for Data Group 1).

Position	Aspect Ratio label	WSS Bits					Format Name	
		0	1	2	3	10	Tube 16:9	Tube 4:3
N/A	FORMAT_4_3	0	0	0	1	0	4:3	FULL SCREEN
CENTRE	FORMAT_14_9	1	0	0	0	0	ZOOM 14:9	FULL SCREEN
TOP	FORMAT_14_9	0	1	0	0	0	DEFAULT	DEFAULT
CENTRE	FORMAT_16_9	1	1	0	1	0	ZOOM 16:9	FULL SCREEN
TOP	FORMAT_16_9	0	0	1	0	0	FULL SCREEN	FULL SCREEN
CENTRE	FORMAT_16_9_PLUS	1	0	1	1	0	ZOOM 16:9	FULL SCREEN
CENTRE	FORMAT_14_9_FULL	0	1	1	1	0	FULL SCREEN	14:9
N/A	FORMAT_16_9_ANAM	1	1	1	0	0	FULL SCREEN	16:9
N/A	SUBTITLE_OUT_IMAGE	X	X	X	X	1	FULL SCREEN	FULL SCREEN

There are the following output possibilities;
- 4:3
- 14:9
- 16:9
- ZOOM 14:9
- ZOOM 16:9
- FULL SCREEN (for either 4:3 or 16:9 tubes)

DEFAULT refers to a signal for which there is no implementation, so is treated as if there is no signal data available.

5.4.6.2 SCART Pin 8 Data (Slow Switching)
When there is a signal from SCART 1 pin 8 or SCART 2 pin 8 (named the Slow Switching SSW signal) the TV will enter AV mode, unless the user forces another source (which is possible even though slow switching is present).

Position	Aspect Ratio	Switching Voltage Level	Format Name	
			Tube 16:9	Tube 4:3
CENTRE	4:3	HIGH	4:3	FULL SCREEN
CENTRE	16:9	MEDIUM	FULL SCREEN	16:9

The SCART 1 signal SSW1 has priority over SSW2.

5.4.6.3 Picture Format Description
From the information collected from the above sources is the input, from which the TV must decide which format to select. The WSS data always has priority over Slow Switching.

If no valid data is received from either source, then a default value must be assumed (this is controlled also by the user by the use of "ZOOM AUTO" in the "FEATURES" menu).

5.4.6.3.1 16:9 CRT
Formats available with 16:9 cathode ray tube;
- 4:3 (AUTO selectable)
- 14:9 (AUTO selectable)
- ZOOM 14:9 (AUTO selectable)
- ZOOM 16:9 (AUTO selectable)
- FULL SCREEN (AUTO selectable)
- PANORAMA (only available/selectable by the user)
- FAVOURITE (only available/selectable by the user)

The table below gives a summary of the FORMAT modes available with a 16:9 CRT, and their given properties.

Format Name	Zoom factor-16:9 CRT		Description	Application
	Vertical	Horizontal		
4:3	100%	75%	Picture is centred with right hand side of the display.	Standard 4/3 picture. with 576 active lines
14:9	114%	87%	Picture is centred with black bars at the left and right hand side of the display.	14:9 picture-letter box format with 504 active lines
ZOOM 14:9	114%	100%	Picture is displayed filling the full width of the screen by incorporating a small horizontal geometrical error (typically 8% linear)	14:9 picture ? letter box format with 504 active lines
ZOOM 16:9	133%	100%	Picture is displayed filling the full screen (width and height)	16:9 picture-letter box format with 430 active lines
FULL SCREEN	100%	100%	Picture is displayed filling the full screen (width and height)	Standard 16/9 picture with 576 active lines
PANORAMA (not AUTO)	100%	100%	Picture is displayed filling the full screen (width and height) by incorporating a non-linear horizontal geometrical error	Used to fit a picture with 4:3 format on a 16:9 screen by stretching the picture geometry at the borders
FAVOURITE (not AUTO)	100% to 133%	75% to 100%	Customised picture size	User-definable format.

5.4.6.3.2 4:3 CRT

Formats available with 16:9 cathode ray tube;

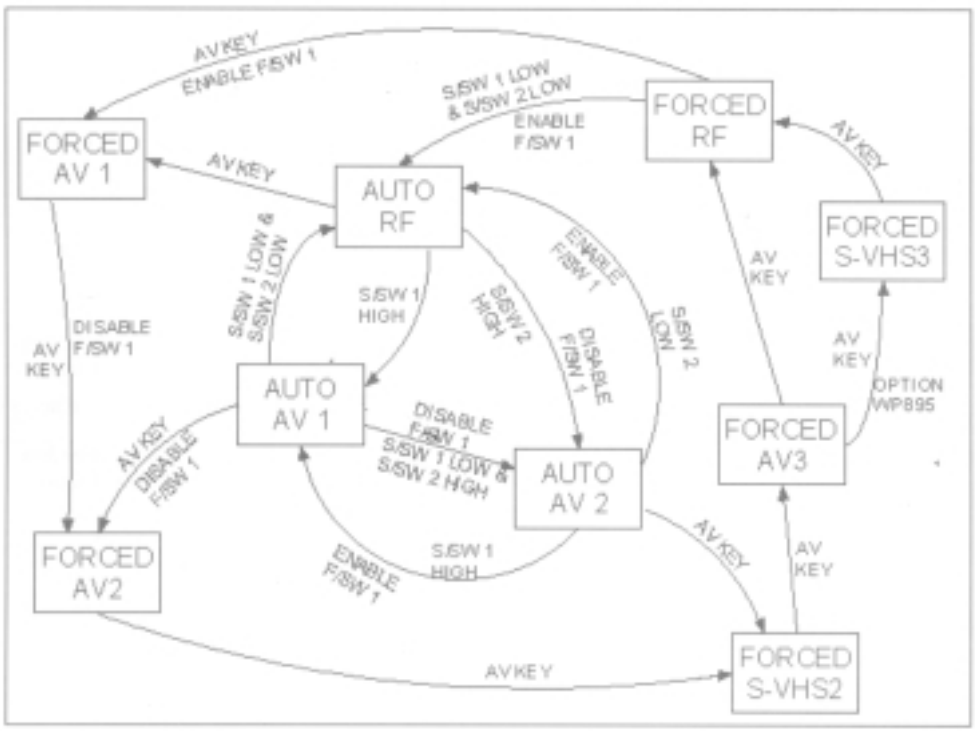
- 14:9 (AUTO selectable)
- 16:9 (AUTO selectable)
- FULL SCREEN (AUTO selectable)
- WATERGLASS (only available/selectable by the user)
- FAVOURITE (only available/selectable by the user)

The table below gives a summary of the FORMAT modes available with a 4:3 CRT, and their given properties.

Format Name	Zoom factor-4:3 CRT Vertical	Horizontal	Description	Application
14:9	87%	100%	Picture is centred with black bars at the top and bottom of the display, realised by compressing the vertical size	14:9 picture-letter box format with 576 active lines
16:9	75%	100%	Picture is centred with black bars at the top and bottom of the display, realised by compressing the vertical size	16:9 pictur-letter box format with 576 active lines
FULL SCREEN	100%	100%	Picture is displayed filling the full screen (width and height)	Standard 4:3 picture with 576 active lines
WATERGLASS (not AUTO)	100%	100%	Picture is displayed filling the full screen (width and height) by incorporating a non-linear horizontal geometrical error	Used to fit a picture with 16:9 format on a 4:3 screen by compressing the picture geometry at the borders
FAVOURITE (not AUTO)	100% to 133%	75% to 100%	Customised picture size	User-definable format.

5.4.7 EXTERNAL SOURCE CONTROL LOGIC

The following schematic, illustrates the logic of control for the two SCART connectors.



The terms used in the schematic are described below;

1. AUTO represents a situation where the television has self-selected its picture source. This could be when the SCART SLOW SWITCHING pin has gone to a high state, and the AV 1 input is selected without the intervention of the user.
2. FORCED represents the change of source which has been commanded by the user (using the EXTERNAL button). The user always has priority, and can override the AUTO change of source by the television.
3. AV KEY represents the EXTERNAL button of the remote control, or on the television.
4. S/SW 1, or S/SW 2 represent the SLOW SWITCHING inputs of the first SCART (AV 1) or second SCART (AV 2), these each being pin number 8.
5. F/SW 1 represents the FAST SWITCHING input of the first SCART (AV 1), on pin number 16. The second SCART, AV 2, input does not possess a FAST SWITCHING input.

The HIGH state of a slow switching input represents the request from the external source to be selected by the television. Whether this is accepted or not depends on the position in the logic diagram. The general rule is that the user always has priority, so the use of the AV KEY will always result in a defined logic path being followed.
Under certain circumstances, defined in the diagram, the change of state of a slow switching input will result in the automatic change of source by the television. This change, such as the change from RF broadcast to the AV 1 input, can always be overridden by the user after the event.
Each line on the diagram, with its associated text, represents the exact conditions under which the change of state will occur. Sometimes this will be accompanied by another action which will be automatically performed by the television, being to either ENABLE or DISABLE F/SW 1.

5.4.8 OVER CURRENT PROTECTION

In case of overload, the SMPS secondary voltages will drop. The voltage on pin 18 of microcontroller drops below a reference voltage (x.xxV). The controlling software which continuously monitors this voltage will switch the set to stand by mode. To power on the set again the user must switch it off using the main power switch. Appropriate hysteresis guaranty a reliable operation.

5.5 TELETEXT DISPLAY

National character option bits C12, C13, C14 are transmitted in the page header of a given teletext page. The national option bits are intended to change (or exchange) 13 characters within the G0 character set, according to the needs of each national language.
These codes represent, for a given broadcaster, the intended language that the teletext page should be displayed in. As there are only 3 bits, there are only 8 codes available to cover all the possible language combinations. This means that for a received code there are several possibilities meanings, according to the local code of practice.

This is not as bad as it first seems, as we use the user-selected OSD language to identify the intention of the broadcaster. For example, a user wishing to see Russian teletext should select
Russian OSD language, otherwise he would not have correct teletext display on the TV.
The table below allows the reader to understand the relationship between selected OSD language (which is under user control), the teletext language display (selected by national option bits in transmission page header) and the Packet 26 language selection (selected within packet 26 of the transmission page).

An example: For Greek teletext display, (if national option code 1 1 1 is received from the broadcaster), the user should select the Greek OSD language. Even if English, French, German, Italian, Spanish, Dutch, Danish, Finnish, Norwegian

or Swedish OSD languages are selected, the teletext will be correctly displayed.
However, if Polish, Hungarian, Czech, Slovakian, Rumanian or Russian OSD are selected, the consequence will be incorrect teletext display for the national option characters. Romanian national font options will be selected.

OSD Language	C12	C13	C14	PRIMARY LANGUAGE	Secondary Language	X26 Language
English, French, German, Italian, Spanish, Dutch, Danish, Finnish, Norwegian, Swedish, Greek	0	0	0	English	English	West Euro
	0	0	1	German	German	West Euro
	0	1	0	Scandinavian	Scandinavian	West Euro
	0	1	1	Italian	Italian	West Euro
	1	0	0	French	French	West Euro
	1	0	1	Spanish	Spanish	West Euro
	1	1	0	Turkish	Turkish	West Euro
	1	1	1	Greek	English	Greek
Polish, Hungarian, Czech, Slovakian, Rumanian	0	0	0	Polish	Polish	East Euro
	0	0	1	German	German	West Euro
	0	1	0	Hungarian	Hungarian	East Euro
	0	1	1	Italian	Italian	West Euro
	1	0	0	French	French	West Euro
	1	0	1	Serbian	Serbian	East Euro
	1	1	0	Czech	Czech	East Euro
	1	1	1	Rumanian	Rumanian	East Euro
Bulgarian,	0	0	0	English	Russian	Cyrillic
	0	0	1	German	German	West Euro
	0	1	0	Estonian	Estonian	East Euro
	0	1	1	Lettish	Lettish	East Euro
	1	0	0	Russian	English	Cyrillic
	1	0	1	Ukrainian	English	Cyrillic
	1	1	0	Czech	Czech	East Euro
	1	1	1	Rumanian	Rumanian	Cyrillic

5.6 SOUND PROCESSING

5.6.1 ANALOGUE SOUND IF - INPUT SECTION

The input pins ANA_IN1+ and ANA_IN- offer the possibility to connect sound IF sources to the MSP 341xG. The analogue-to-digital conversion of the preselected sound IF signal is done by an A/D converter, whose output is used to control an analogue automatic gain circuit (AGC), providing an optimal level for a wide range of input levels.

5.6.2 QUADRATURE MIXERS

The digital input coming from the integrated A/D converter may contain audio information at a frequency range of theoretically 0 to 9 MHz corresponding to the selected standards. By means of two programmable quadrature mixers, two different audio sources ; for example, NICAM and FM-mono, may be shifted into baseband position.

5.6.3 PHASE AND AM DISCRIMINATION

The filtered sound IF signals are demodulated by means of the phase and amplitude discriminator block. On the output, the phase and amplitude is available for further processing.

AM signals are derived from the amplitude information, whereas the phase information serves for FM and NICAM demodulation.

5.6.4 NICAM DECODER

In case of NICAM - mode, the phase samples are decoded according the DQPSK - coding scheme. The output of this block contains the original NICAM bitstream.

5.6.5 DSP SECTION

All audio baseband functions are performed by digital signal processing (DSP). The DSP section controls the source and output selection, and the signals processing.

5.6.6 SOUND MODE SWITCHING

In case of NICAM transmission, the controlling software read the bit error rate and the operation mode from the NICAM Decoder. When the set is in "Auto detection" mode (default mode after ATSS) the MSP firmware set automatically the sound mode (NICAM mono, NICAM Dual 1 or NICAM Dual 2) depending on the transmitted mode.

In case of 2 Carrier FM transmission, the MSP firmware read the transmission mode and the signal quality level from the Stereo Detection Register. When the set is in "Auto detection" mode the firmware set automatically the sound mode (mono, Stereo, Dual 1, Dual 2) depending on the transmitted mode.

In "Auto detection" mode the firmware evaluate the signal quality and automatically switch to the analogy sound carrier 1, if the transmission quality is too poor. To avoid unwanted automatic switching the threshold levels mono to stereo and stereo to mono is different.When the sound mode change, the MSP firmware informs the microcontroller by rising pin 4. This generates an interrupt to the controller, which then read MSP registers via I2C bus to know the new sound status, and update OSD when needed.In "forced mono " mode (locker icon), the controlling software configure the MSP341xG to demodulate only the analogue (FM or AM) sound carrier 1, no matter the signal quality. The sound mode "forced "or "Autodetect" is stored for each programme.

5.7 SOUND AMPLIFICATION

The TDA8944J (TDA8946J) is a stereo BTL audio amplifier capable of delivering 2 x 7 W (2 x 15 W) output power to an 8Ω load at THD = 10%, using a 12 V power supply and an external heatsink. The voltage gain is fixed at 32dB.

With the three-level MODE input the device can be switched from 'standby' to 'mute' and to 'operating' mode.
The TDA 8944J outputs are protected by an internal thermal shutdown protection mechanism and short-circuit protection.

5.7.1 POWER AMPLIFIER

The power amplifier is a Bridge Tied Load (BTL) amplifier with an all-NPN output stage, capable of delivering a peak output current of 1.5 A.

The BTL principle offers the following advantages :

- Lower peak value of the supply current.
- The ripple frequency on the supply voltage is twice the signal frequency.
- No DC-blocking capacitor
- Good low frequency performance

5.7.2 MODE SELECTION

The TDA894xJ has several functional modes, which can be selected by applying the proper DC voltage to pin MODE.

Mute : In this mode the amplifier is DC biased but not operational (no audio output). This allows the input coupling capacitors to be charged to avoid pop-noise. The devices is in mute mode when 2.5 V < VMODE < (Vcc-1.5 V).

Operating : In this mode the amplifier is operating normally. The operating mode is activated at VMODE < 0.5 V.

5.8 VERTICAL DEFLECTION

The vertical driver circuit is a bridge configuration. The deflection coil is connected between the output amplifiers, which are driven in phase opposition. The differential input circuit is voltage driven. The input circuit is especially intended for direct connection to driver circuits which deliver symmetrical current signals, but is also suitable for asymmetrical currents. The output current of these devices is converted to voltages at the input pins via resistors R350 and R351. The differential input voltage is compared with the output current through the deflection coils measured as voltage across R302, which provides internal feedback information. The voltage across R302 is proportional to the output current.

5.8.1 FLYBACK VOLTAGE

The flyback voltage is determined by an additional supply voltage Vflb. The principle of operation with two supply voltages (class G) makes it possible to fix the supply voltage Vp optimum for the scan voltage and the second supply voltage Vflb optimum for the flyback voltage. Using this method, very high efficiency is achieved. The supply voltage Vflb is almost totally available as flyback voltage across the coil, this being possible due to the absence of a coupling capacitor.

5.8.2 PROTECTION

The output circuit has protection circuits for :

- Too high die temperature
- overvoltage of output stage A

5.8.3 GUARD CIRCUIT

The guard signal is not used by the video IC to blank the screen in case of fault condition.

5.8.4 DAMPING RESISTOR

For HF loop stability a damping resistor (R331) is connected across the deflection coil.

5.8.5 EAST-WEST AMPLIFIER (TDA8358J ONLY)

The East-West amplifier is current driven. It can only sink currents of the diode modulator circuit.
A feedback resistor R397 is connected between the input and output of this inverting amplifier in order to convert the East-West correction input into an output voltage.

5.9 POWER SUPPLY (STR F6654)

5.9.1 STR-F6654 GENERAL DESCRIPTION

The STR-F6654 is an hybrid IC with a build-in MOSFET and control IC, designed for flyback converter type switch mode power supply applications.

5.9.2 POWER SUPPLY PRIMARY PART OPERATIONS

An oscillator generates pulses signals which turn on and off a MOSFET transistor.

5.9.2.1 Start -up Circuit: VIN

The start-up circuit is used to start and stop the operation of the control IC, by detecting a voltage appearing at VIN pin (pin 4).

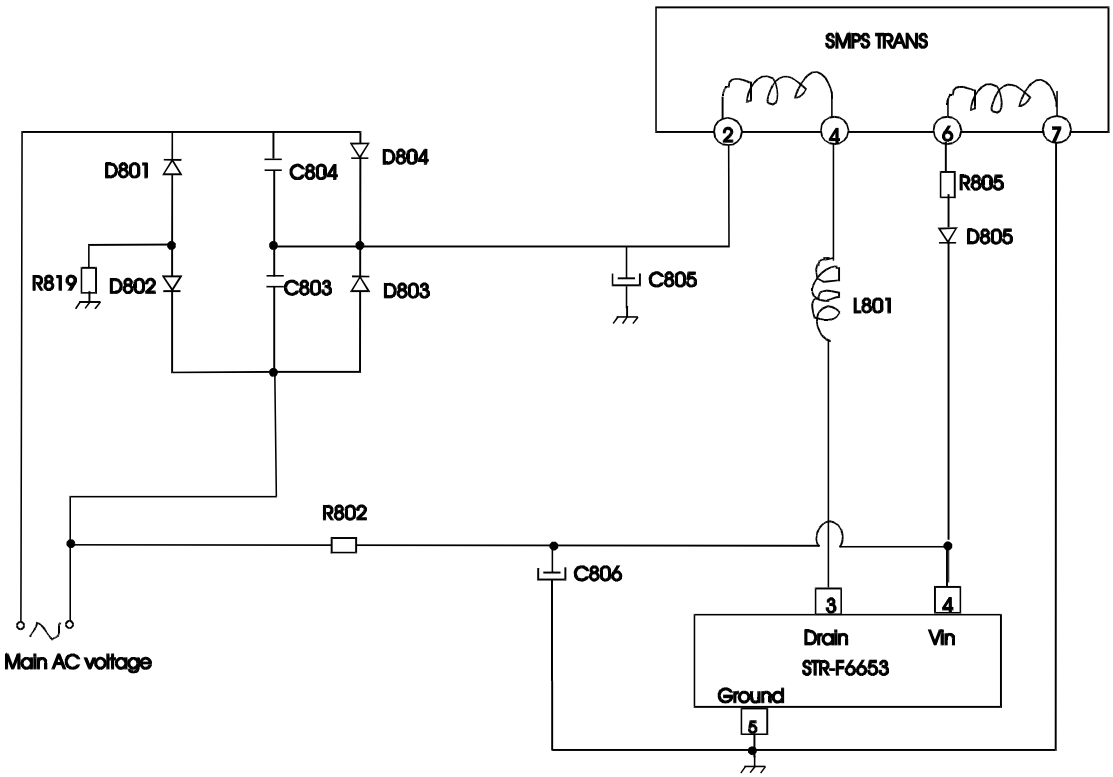


Fig :Power supply start-up circuit

When the power switch is pushed on, VIN increases slowly. During this time, C806 is charged through R802.

As soon as VIN reaches 16V, the STR-F6654 control circuit starts operating. Then, VIN is obtained by smoothing the winding voltage which appears between pin6 and pin7 of the SMPS transformer.

As this winding voltage does not increase to the set voltage immediately after the control circuit starts operating, VIN starts dropping. However, as this winding voltage reaches the set value before VIN voltage drops to the shutdown voltage (at 11V), the control circuit continues operating (see below VIN voltage at start-up). R805 resistor prevents that VIN pin voltage varies according to the secondary side output current.

VIN must be set higher than the shutdown voltage (VIN (off) = 11Vmax) and lower than the O.V.P.
(overvoltage protection) operating voltage
(VOVP = 20.5Vmin)

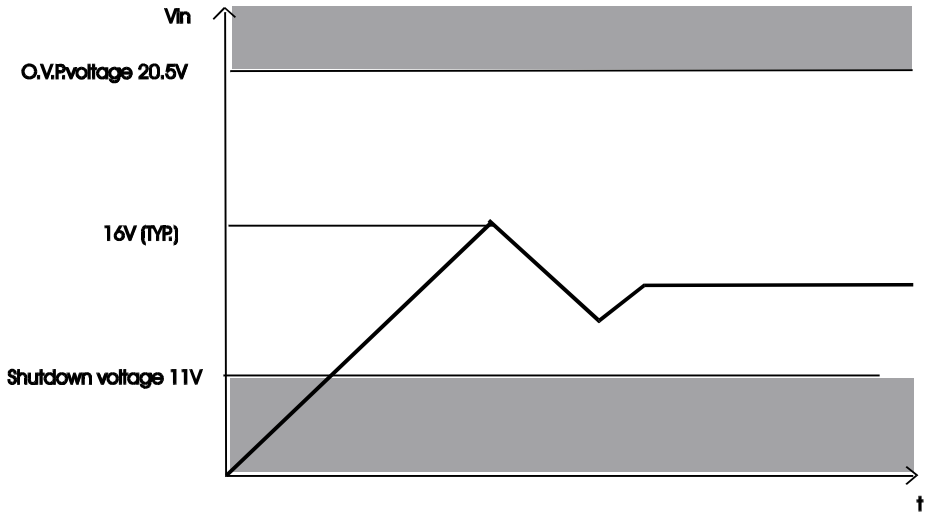


Fig. :Waveform of Vin pin voltage at start-up

5.9.2.2 STR-F6654 Oscillating Operation

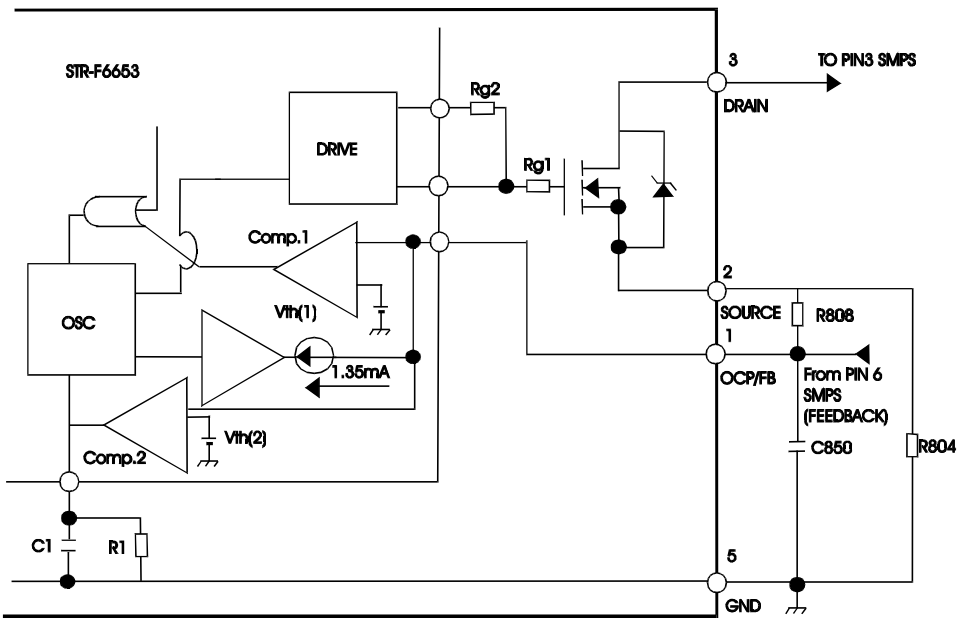
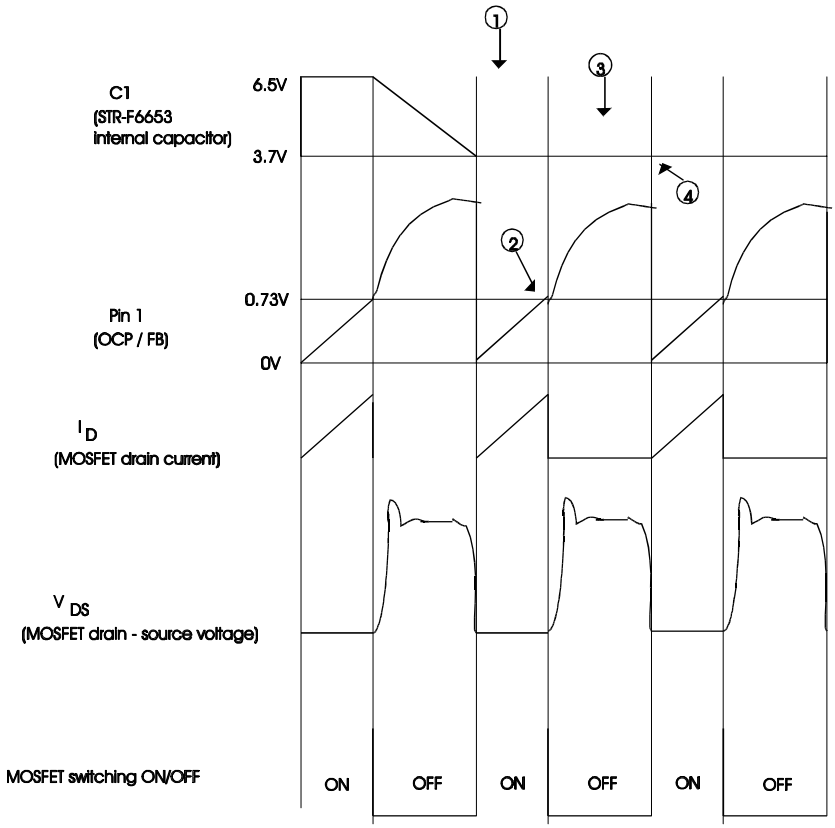


Fig. : oscillating operation



- When the MOSFET is ON, the STR-F6654 internal capacitor C1 is charged at the constant voltage 6.5V. At the same time, the voltage at pin 1 (OCP / FB) increases with the same waveform as the MOSFET drain current.
- When the pin 1 voltage reaches the threshold voltage VTH1 = 0.73V, the STR-F6654 internal comparator 1 starts operating. The STR-F6654 internal oscillator is inverted and the MOSFET turns OFF.
- hen the MOSFET turns OFF, charging of STR-F6654 internal capacitor C1 is released and C1 starts discharging by the STR-F6654 internal resistance R1. So, C1 voltage starts falling in accordance with the gradient regulated by the constant discharging time of C1 and R1. So, this means that the fixed time determined by C1 and R1 is the OFF-time of the MOSFET.
- When C1 voltage falls to around 3.7V, the STR-F6654 internal oscillator is reversed again and the MOSFET turns ON. C1 is quickly charged to around 6.5V

The MOSFET continues to oscillate by repeating the above procedure.

5.9.2.3 STR-F6654 Protection Circuits

- overcurrent protection function (OCP)

Overcurrent protection is performed pulse by pulse detecting at STR-F6654 pin 1 (OCP) the peak of the MOSFET drain current in every pulse.

- latch circuit

This circuit sustains an output low from the STR-F6654 internal oscillator and stops operation of the power supply when overvoltage protection (OVP) and thermal shutdown (TSD) circuit are under operation

■ thermal shutdown circuit (TSD)

This circuit triggers the latch circuit when the frame temperature of STR-F6654 IC exceeds 140°C

■ overvoltage protection circuit (OVP)

This circuit triggers the latch circuit when the Vin voltage exceeds 22V (typ.)

5.10 TV START-UP, TV NORMAL RUN AND STAND BY MODE OPERATIONS

5.10.1 TV START-UP OPERATIONS

5.10.1.1 Schematic Diagram For Start-Up Operations

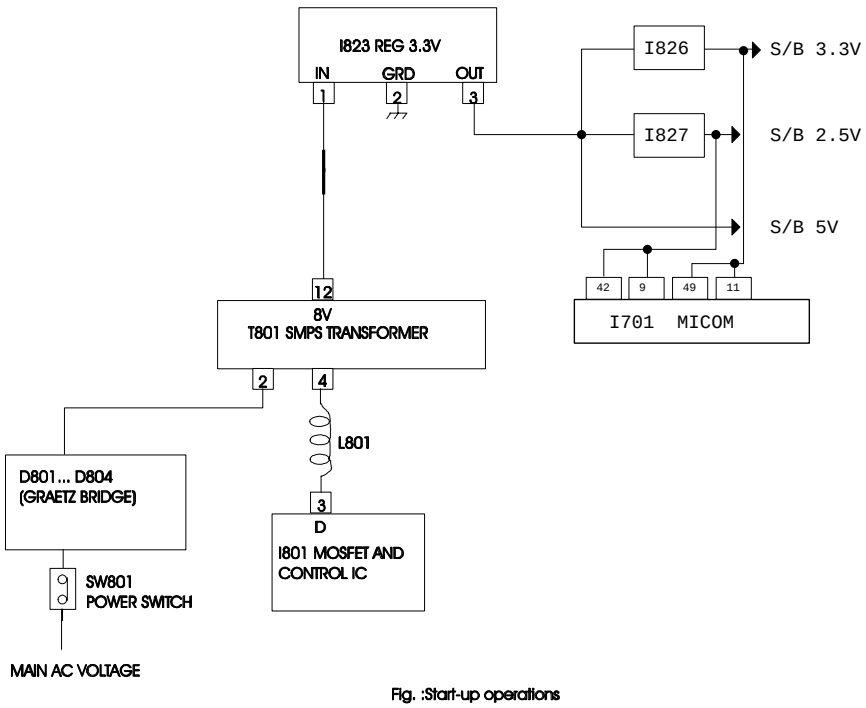


Fig. :Start-up operations

5.10.1.2 TV Start-Up And Microcontroller Initialisation

- When SW801 power switch is pushed, main AC voltage is applied to T801 transformer (after rectification by D801...D804 diodes). Then, T801 SMPS transformer starts operating and supplies DC voltage to I823(5V regulator), to I826(3.3V regulator) and to I827(2.5V regulator).

- These regulators provide 3.3V/2.5V DC voltage to I701 microcontroller power supply pins (pins 42/9, pins 11/44) and to the reset pulse circuit which provides reset pulse to I701 microcontroller reset pin (pin 8).

- Then, the microcontroller starts its initialisation. Its power pin (pin 52) is set to high which allows delivery of power supply voltages (123V, 8V, 5V...). At this step, all IC's start working but no picture appears on screen: I701 IC doesn't provide horizontal drive voltage.

- Then, the microcontroller consults I702 EEPROM via I2C bus to know the last TV set mode (normal run mode or stand-by mode) before switching off.

- If the TV set was on normal run mode before switching off, the microcontroller delivers horizontal drive voltage at pin 23 on the I502 and picture appears on screen.

- If the TV set was on stand-by mode before switching off, the microcontroller switches TV set to stand-by mode, decreasing power pin voltage (pin 1 – I701). This matter will be explained on paragraph 5.10.2.2.

5.10.2 TV NORMAL RUN AND STAND-BY MODE OPERATIONS

Depending on remote control commands, I701 microcontroller part pin 52 (power) is set to:

- high for normal run mode
- low for stand-by mode

5.10.2.1 TV On Normal Run Mode

5-10-2-1-1 I701 microcontroller part pin 52 (power) effect

I701 microcontroller part pin 52 (power) is connected to the following circuit:

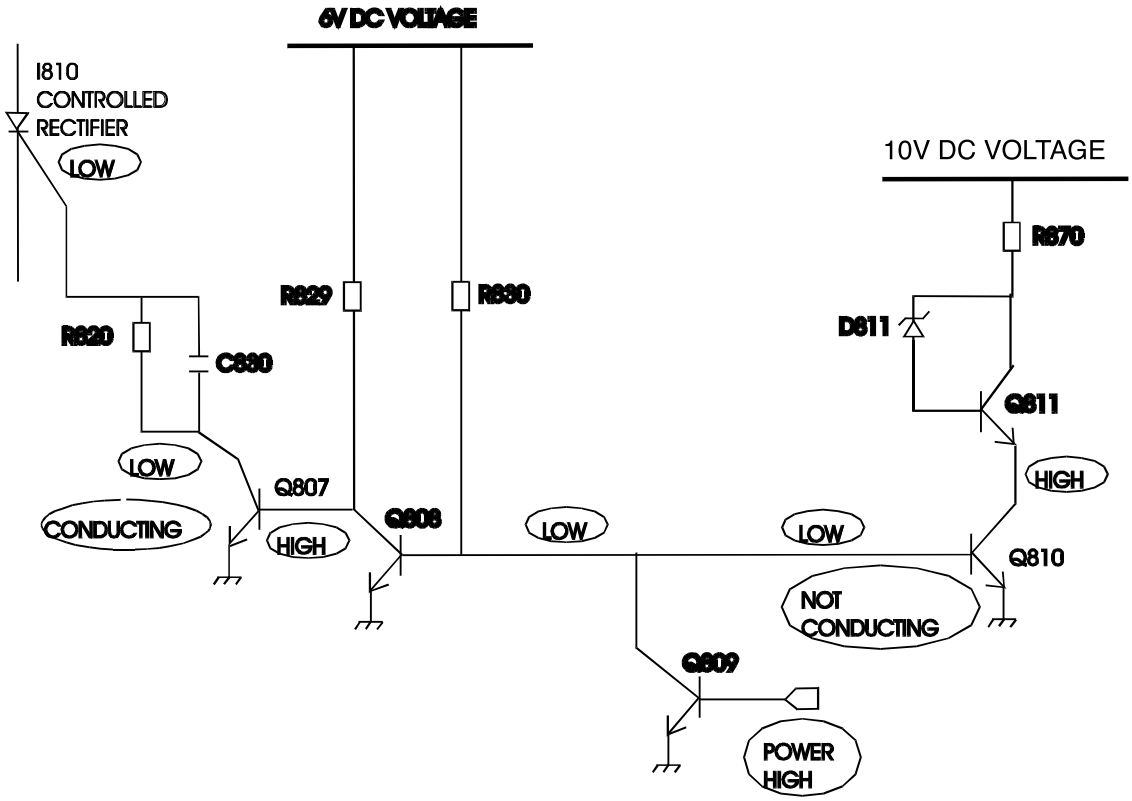


Fig. : I701 microcontroller part pin 52(POWER) effect

On normal run mode, I701 microcontroller pin 52 (power) is set to high

So, I810 controlled rectifier is not conducting

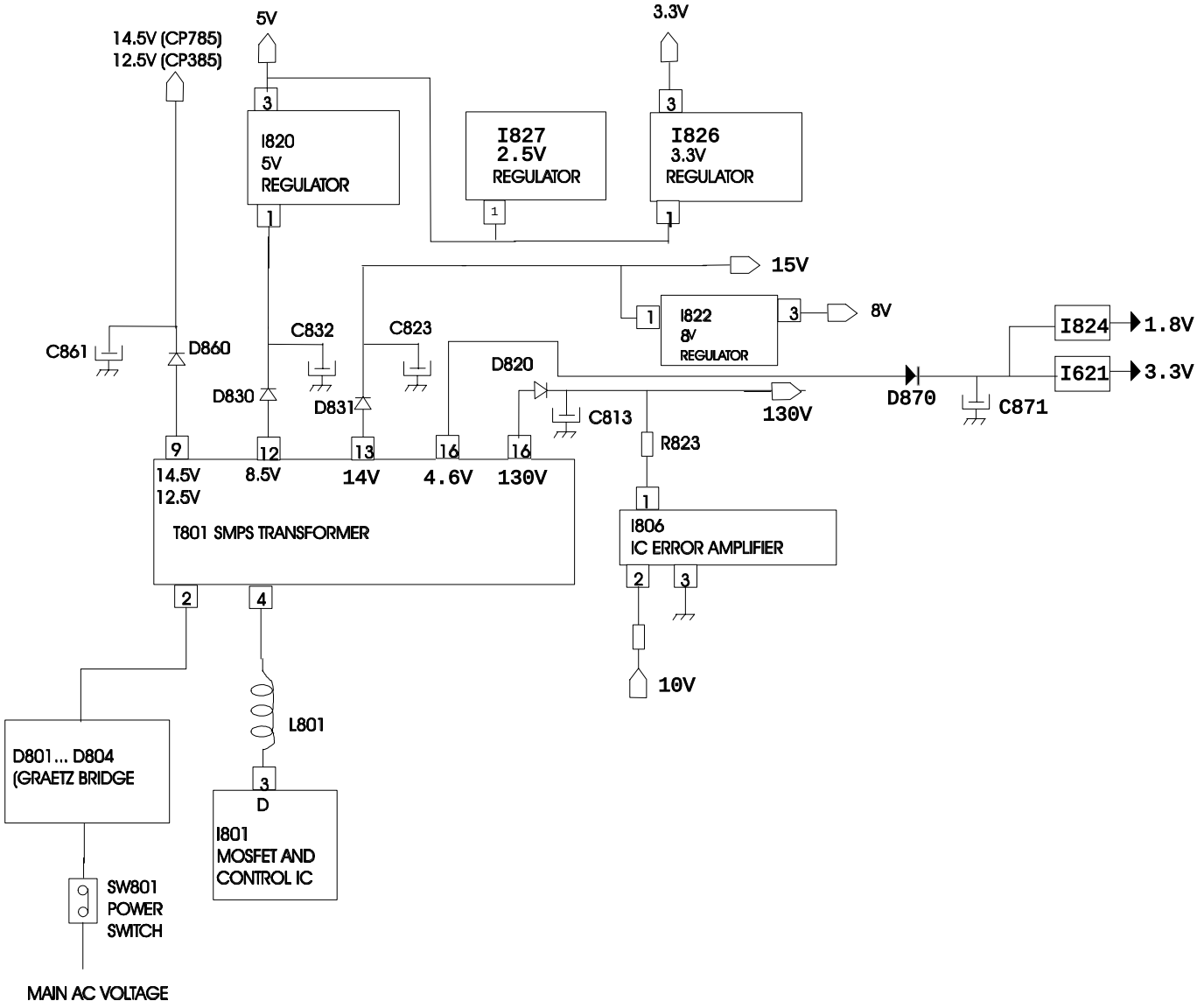
- Q809 is conducting. So, Q808 is not conducting and Q807 is conducting
- So, Q807 collector is connected to the ground and I810 controlled rectifier gate pin is set to low (no conducting)

So, current from 10V DC voltage (from T801 SMPS transformer pin 13) does not flow through Q811 and Q810 transistors but flows through I806 IC error amplifier

- Q809 is conducting. So, Q810 is not conducting and no current flows from Q810 collector to the ground

Therefore, the power circuit diagram is the following one:

5-10-2-1-2 power supply circuit diagram during TV set normal run



5-10-2-1-3 power supply functioning during TV set normal run mode

- I801 transmits controlled pulses to T801 which generates DC voltages after rectifications by secondary part diodes and electro capacitors (by example by D820 and C813 on 130V supply voltage line).

- 8V, 5V, 3.3V, 1.8V supply voltage lines have stabilized voltages obtained by I822, I820, I824, I821 voltage regulators.

- 5V, 3.3V, 1.8V stand-by supply voltage lines have stabilized voltages obtained by I823, I826, I827 voltage regulators.

- On 130V supply voltage line, R823 resistor has been chosen to reach exact DC voltage required on this line.

- 130V supply voltage line includes an IC error amplifier (I806) which corrects unexpected DC voltage variations on this line.

5-10-2-1-4 power supply IC delivery during TV set normal run

power supply line	IC power supply delivery	Remarks
130V	FBT	FBT supplies 35V to I301 vertical IC FBT supplies 11V to I301 vertical IC FBT supplies 33V to the tuner FBT supplies 180V to I901 video amplifier pin 6
14.5V	I602 sound amplifier pins 3-16	
14V	T401 H- drive	
8V	I601 Sound Demod pins 38-39-	
5V	I101 IF IC pin 23 I502 IC pin 47 I601 Sound Demod pins 7-18-57 I702 EEPROM pin 8 Tuner	
3.3V	I501 and I502 Main IC pins	
S/B 5V	I703 IR receiver pin 1	
S/B 3.3V	I701 pins and I502 pins	

5.10.2.2 TV Set On Stand-By Mode

5-10-2-2-1 TV set circuit diagram on stand-by mode

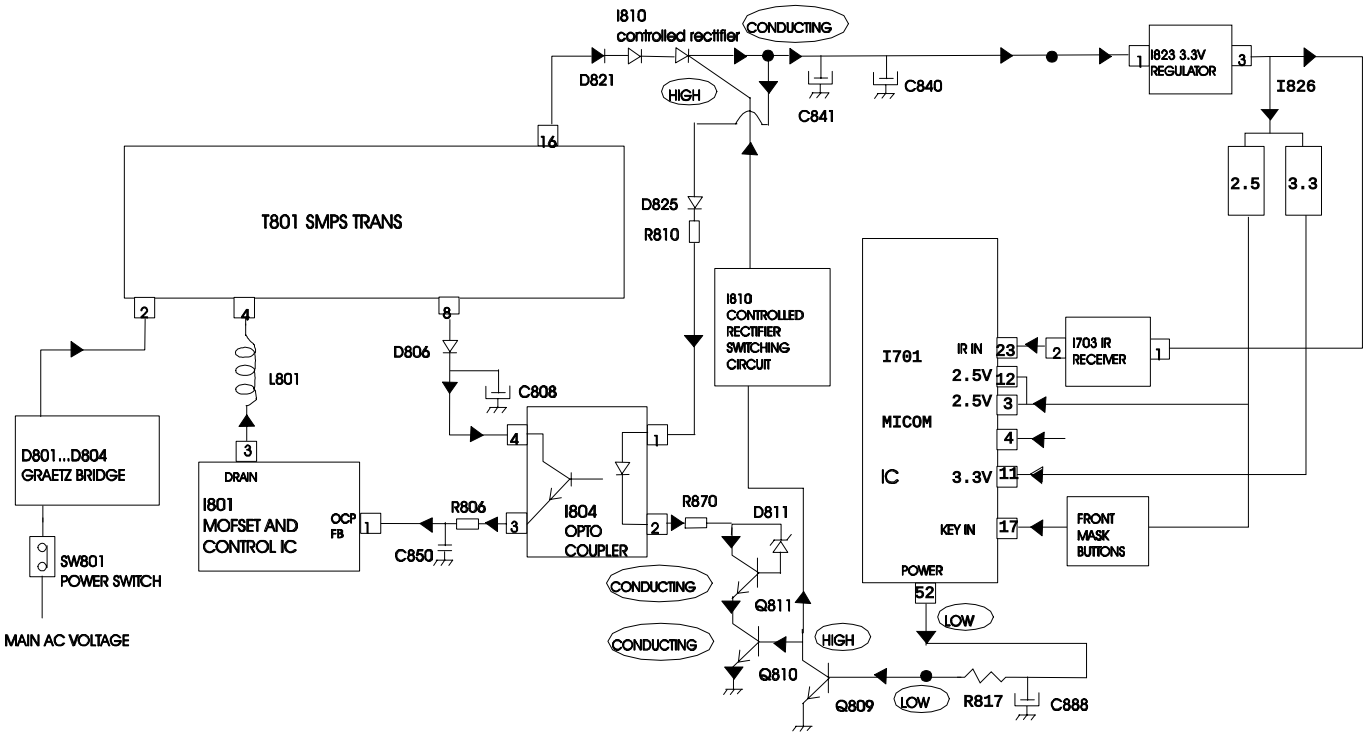
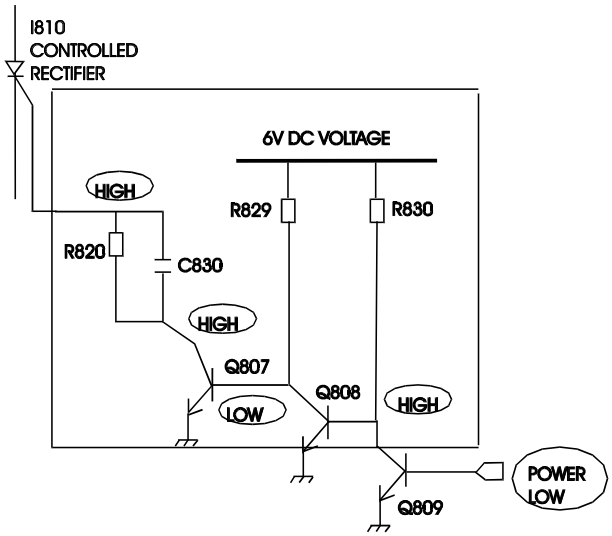


Fig. : Power supply operation in stand - by mode



5-10-2-2-2 TV set stand-by mode operations

- ∑ On stand-by mode, I701 microcontroller pin 52 (power) is set to low.
- So, Q809 collector is set to high.
- Then, I810 controlled rectifier gate pin is set to high and I810 is conducting.
- So, current flows from pin 16 SMPS transformer to the ground via I804 optocoupler and Q810 and Q811 transistors (which are conducting).
- In these conditions, I801 delivers pulses on light mode and T801 produces voltages with reduced power.
- As I810 is conducting, current flows also from pin 16 SMPS transformer to I823 (5V regulator) for I701 μcom, IR receiver and front mask buttons supply voltage (then, remote control or front mask buttons can be activated to leave stand-by mode).

6. SERVICE PARTS LIST

Caution:In this Service Manual, some parts can be changed for imroving, their performance without notice in the parts list. So, If you need the latest parts information, please refer to PPL(Parts Price List)in Service information Center(http://svc.dwe.co.kr)

6.1 DTH-2881FLF-S

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
12000	48B4846G2201	TRANSMITTER REMOCON	R-46G22 (AAA)	
13000	4850Q00910	BATTERY	AAA R03/NN SUPERGARD	
14000	4858213801	BAG INSTRUCTION	L. D. P. E. T0. 05X250X40	
ZZ120	PTBCSHH2881S	COVER BACK AS	DTH-2881FLF-S	
M211	4852158911	COVER BACK	HIPS GY 28W5	
M211D	4857817610	CLOTH BLACK	“300 MM 20”” “	
M541	4855415800	S/PLATE	150ART P/E FILM (C/TV)	
M542	485580002207	LABEL SERIAL	ART 90	
ZZ130	PTCACAH2881FFL	SCABINET AS	DTH-2881FLF-S	
M211A	7172401612	SCREW TAPPING	TT2 TRS 4X16 MFZN BK	
M211B	7178301212	SCREW TAPPITE	TT2 WAS 3X12 MFZN BK	
M211C	4856013600	SCREW SPKR FIX	SWRM+SECC	
M281	4851949001	DOOR AS	2823601+5549401 2881	
M352	4853535600	HOLDER CORD	NYROLN 66	
M481	4854864301	BUTTON POWER	HIPS GY 2881	
M481A	4856716000	SPRING	14Q1/M3 SWPA PIE0.5	
M501	485506054001	DECO CTRL	PVC T0.25 (2881/W9) BLACK	
M561	48556174SD01	MARK BRAND	“DAEWOO 28”” BLACK “	
M681	4856812001	TIE CABLE	NYLON66 DA100	
M682	4856816300	CLAMP WIRE	NYLON 6 (V0)	
M791	4857923300	DOOR LOCK	LA701 (KIFCO)	
P405	4850704N07	CONNECTOR	SE100J+172792+USW=500	
PWC1	4859903511	CORD POWER	CW4232 H03VVH2-F=2250	
SP01A	7172401212	SCREW TAPPING	TT2 TRS 4X12 MFZN	
SP02A	7172401212	SCREW TAPPING	TT2 TRS 4X12 MFZN	
V901	4859638460	“CRT (PHILIPS 28””) “	W66ERF022X044	
V901A	4856215402	WASHER RUBBER	20”	
V901B	4856015830	SCREW CRT FIX	L=32	
ZZ131	58G0000151	COIL DEGAUSSING	DC-28SFW	
ZZ132	48519A5510	CRT GROUND AS	2801H-1015-2P	
ZZ200	PTFMSJH2881S	MASK FRONT AS	DTH-2881FLF-S	
M201	4852083701	MASK FRONT	HIPS GY 2881	
ZZ201	PTSPPWD830	SPEAKER AS	DTG-28A7FZF	
51000	4858311110	SPEAKER	12W 8 OHM SP-58126F	
51100	4850704S30	CONN AS	YH025-04+35098+ULW=700	
52000	4858311110	SPEAKER	12W 8 OHM SP-58126F	
ZZ206	PTFPMSH28W8FP	PCB FILTER MANUAL AS	DTH-28W8FZP	
CF802	CL1UC3474M	C LINE ACROSS	0.47MF 1J(UCVSNDF/SV	
LF200	5PS2901N2-	FILTER PFC CHOKE	B82991-S2901-N2	
PF01A	4859238620	CONN WAFER	YPW500-02	
PF02A	4859238620	CONN WAFER	YPW500-02	
PF02B	4850702N08	CONN AS	YPH500-02+YLT500+USW=300	
PF802	4859242220	CONN WAFER	YFW800-02	
RF801	DPC7R0M290	POSISTOR	96709 (BC)	
ZZ200	PTFPJBH28W8FP	PCB FILTER EYE LET A	DTH-28W8FZP	
A001	4859811824	PCB FILTER	CP-810100X50(246X246/1X8)	
E804	4856310300	EYE LET	BSR T0.2 (R1.6)	
E805	4856310300	EYE LET	BSR T0.2 (R1.6)	
E806	4856310300	EYE LET	BSR T0.2 (R1.6)	
E807	4856310300	EYE LET	BSR T0.2 (R1.6)	
E808	4856310300	EYE LET	BSR T0.2 (R1.6)	
E809	4856310300	EYE LET	BSR T0.2 (R1.6)	
E810	4856310300	EYE LET	BSR T0.2 (R1.6)	
E811	4856310300	EYE LET	BSR T0.2 (R1.6)	
E812	4856310300	EYE LET	BSR T0.2 (R1.6)	
E813	4856310300	EYE LET	BSR T0.2 (R1.6)	
E814	4856310300	EYE LET	BSR T0.2 (R1.6)	
ZZ290	PTMPMSH2881FFL	PCB MAIN MANUAL AS	DTH-2881FLF-S	
10	2193100801	SOLDER BAR	SN:PB=63:37 3PI(NO FLUX)	
40	2291050314	FLUX SOLVENT	IM-1000	
20	2193011101	SOLDER WIRE	RS 60-1.2 1.6A	
30	2291050617P	FLUX SOLDER	CF-329D	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
60	2291051001	FLUX KILLER	KFT-7	
C106	CEXF1H221V	C ELECTRO	50V RSS 220MF (10X16) TP	
C118	CMXL1J474J	C MYLAR	63V 0.47MF MKT	
C404	CMYH3C103J	C MYLAR	1.6KV 0.01MF J	
C405	CMYE2J183J	C MYLAR	630V PU 0.018MF J	
C408	CMYE2G304J	C MYLAR	400V 0.3MF J (PL)	
C415	CEXF2E100V	C ELECTRO	250V RSS 10MF (10X20) TP	
C416	CCYR3D681K	C CERA	2KV R 680PF K 125C	
C417	CMYE2G103J	C MYLAR	400V PU 0.01MF J	
C418	CEYD1H689W	C ELECTRO	50V RHD 6.8MF (16X35.5)	
C604	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
C805	CEYN2G181P	C ELECTRO	400V LHS 180MF (25X35)	
C811	CCYR3D221K	C CERA	2KV R 220PF K 125C	
C812	CH1BFE472M	C CERA AC	AC400V 4700PF M U/C/V	
C813	CEXF2E101V	C ELECTRO	250V RSS 100MF 18X35.5	
C814	CEYF2E470V	C ELECTRO	250V RSS 47MF (16X25	
C820	CCYR3A471K	C CERA	1KV 470PF K 125C	
C823	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
C832	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
C840	CEXF1C332V	C ELECTRO	16V RSS 3300MF	
C841	CEXF1C222V	C ELECTRO	16V RSS 2200MF(13X25)TP	
C845	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
C861	CEXF1E102C	C ELECTRO	25V RUS 1000MF 13X20 TP	
C866	CCYR3A471K	C CERA	1KV 470PF K 125C	
C871	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
D404	DFMP3FU—-	DIODE	FMP3FU	
D404A	4857027611	HEAT SINK	AL EX BK	
D404B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
D820	DBYW76——	DIODE	BYW76	
D860	DBYW76——	DIODE	BYW76	
F801	5FSCB4022R	FUSE CERA	SEMKO F4AH 4A 250V MF51	
I101	1TDA4470M-	IC IF	TDA4470-M	
I301	1TDA8358J-	IC VERTICAL	TDA8358J	
I301A	4857028227	HEAT SINK	AL EX ANODIZING	
I301B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN	
I601	1MSP3411V3	IC SOUND	MSP3411G-PP-B8-V3	
I602	1TDA8946J-	IC AUDIO	TDA8946J	
I602A	4857028215	HEAT SINK	AL EX NO ANODOZING	
I602B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN	
I701	1SDA555XFL	IC MICOM OTP	SDA555XFL	
I702	1AT24C16PC	IC MEMORY	AT24C16-10PC	
I703	1TS0P1238W	IC PREAMP	TSOP1238WI1	
I801	1STRF6654-	IC SMPS	STR-F6654	
I801A	4857027920	HEAT SINK	AL EX NO ANODIZING	
I801B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
I804	1KP1010C—	IC PHOTO COUPLER	KP-1010C	
I806	1DP130——	IC ERROR AMP	DP130	
I810	TX0202DA—	THYRISTOR	X0202DA	
I820	1L7805CV—	IC REGULATOR	L7805CV	
I821	1LD1117V33	IC REGULATOR	LD1117AV33 3.3V TO-220	
I822	1L7808CV—	IC REGULATOR	L7808CV	
I823	1LD1117V50	IC REGULATOR	LD1117AV50 5.0V TO-220	
I824	1LD1117V18	IC REGULATOR	LD1117AV18 1.8V TO-220	
I826	1LD1117V33	IC REGULATOR	LD1117AV33 3.3V TO-220	
I827	1LD1117V25	IC REGULATOR	LD1117AV25 2.5V TO-220	
JP01	4859102130	JACK EARPHONE	YSC-1537	
JPA1	4859200401	SOCKET RGB	SR-21A1 (ANGLE TYPE)	
JPA2	4859200401	SOCKET RGB	SR-21A1 (ANGLE TYPE)	
JPA3	4859108450	JACK PIN BOARD	YSC03P-4120-14A	
JPA4	4859106740	SVHS JACK	PH-SJ-9505A	
L150	58E0000041	COIL AFT	TRF-A005	
L380	58C0000120	COIL CHOKE	CH-100Q	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
L381	58C0000120	COIL CHOKE	CH-100Q	
L401	58H0000074	COIL H-LINEARITY	TRL-6R3D	
L403	58C0000118	COIL CHOKE	CH-191A	
LF801	5PLF24A1—	FILTER LINE	LF-24A1	
M351	4858900002	HOLDER LED AS	LH-3P	
M791	4857913304	RUBBER CUSHION	FR RUBBER SPONGE	
P401	4850705S04	CONN AS	YH025-05+YST025+ULW=400	
P402	4859242420	CONN WAFER	YFW800-04	
P501	4850708N15	CONNECTOR	YH025-08+YBNH250+USW=600	
P601	4859231720	CONN WAFER	YW025-04	
P801	4859287320	CONN WAFER	MKS2822 (LOMAX NEW TYPE)	
PF01	4859238620	CONN WAFER	YPW500-02	
PF01B	4850702N08	CONN AS	YPH500-02+YLT500+USW=300	
PF02	4859238620	CONN WAFER	YPW500-02	
Q401	TST2310DH1	TR	ST2310DHI	
Q401A	4857027930	HEAT SINK	AL EX BK (ANODIZING)	
Q401B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
R331	RS01Y201J-	R M-OXIDE FILM	1W 200 OHM J	
R388	RW02Y678FS	R WIRE WOUND	2W 0.67 OHM F SMALL	
R399	RS02Y829JS	R M-OXIDE FILM	2W 8.2 OHM J SMALL	
R401	RS02Y820JS	R M-OXIDE FILM	2W 82 OHM J SMALL	
R415	RS02Y681JS	R M-OXIDE FILM	2W 680 OHM J SMALL	
R444	RS02Y330JS	R M-OXIDE FILM	2W 33 OHM J SMALL	
R802	RS02Y753JS	R M-OXIDE FILM	2W 75K OHM J SMALL	
R804	RF01Y158K-	R FUSIBLE	1W 0.15 OHM K	
R819	RX10B339JN	R CEMENT	10W 3.3 OHM J BENCH 4P	
R850	RS02Y129JS	R M-OXIDE FILM	2W 1.2 OHM J SMALL	
R854	RS02Y569JS	R M-OXIDE FILM	2W 5.6 OHM J SMALL	
SF1	5PK3953M—	FILTER SAW	K3953M	
SF2	5PK9650M—	FILTER SAW	K9650M	
SW801	5S40101143	SW PUSH	PS3-22SP (P.C.B)	
T401	50D25A2—-	TRANS DRIVE	TD-25A2	
T402	50H0000252	FBT	1362.5022	
T801	50M4936B4-	TRANS SMPS	2094.0074B	
U100	4859724930	TUNER VARACTOR	UV1316/AI-4	
X501	5XE20R250E	CRYSTAL QUARTZ	HC-49/U 20.2500MHZ 30PPM	
X601	5XE18R432E	CRYSTAL QUARTZ	HC-49/U 18.43200MHZ 30PPM	
X701	5XE6R0000C	CRYSTAL QUARTZ	HC-49/U 6.0000 MHZ 20PPM	
Z153	5PYXT5R5MB	FILTER CERA	XT5.5MB	
ZZ200	PTMPJBH2881FFL	PCB MAIN EYE LET AS	DTH-2881FLF-S	
E003	4856310600	EYE LET	BSR 2.3(R2.3)	
E004	4856310600	EYE LET	BSR 2.3(R2.3)	
E10	4856310600	EYE LET	BSR 2.3(R2.3)	
E11	4856310600	EYE LET	BSR 2.3(R2.3)	
E12	4856310600	EYE LET	BSR 2.3(R2.3)	
E13	4856310600	EYE LET	BSR 2.3(R2.3)	
E14	4856310600	EYE LET	BSR 2.3(R2.3)	
E15	4856310600	EYE LET	BSR 2.3(R2.3)	
E16	4856310600	EYE LET	BSR 2.3(R2.3)	
E17	4856310600	EYE LET	BSR 2.3(R2.3)	
E18	4856310600	EYE LET	BSR 2.3(R2.3)	
E19	4856310600	EYE LET	BSR 2.3(R2.3)	
E20	4856310600	EYE LET	BSR 2.3(R2.3)	
E21	4856310600	EYE LET	BSR 2.3(R2.3)	
E22	4856310600	EYE LET	BSR 2.3(R2.3)	
E23	4856310600	EYE LET	BSR 2.3(R2.3)	
E24	4856310600	EYE LET	BSR 2.3(R2.3)	
E25	4856310600	EYE LET	BSR 2.3(R2.3)	
E26	4856310300	EYE LET	BSR T0.2 (R1.6)	
E27	4856310300	EYE LET	BSR T0.2 (R1.6)	
E28	4856310300	EYE LET	BSR T0.2 (R1.6)	
E29	4856310300	EYE LET	BSR T0.2 (R1.6)	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
E30	4856310300	EYE LET	BSR T0.2 (R1.6)	
E31	4856310300	EYE LET	BSR T0.2 (R1.6)	
E32	4856310300	EYE LET	BSR T0.2 (R1.6)	
E33	4856310300	EYE LET	BSR T0.2 (R1.6)	
E34	4856310300	EYE LET	BSR T0.2 (R1.6)	
E35	4856310300	EYE LET	BSR T0.2 (R1.6)	
E36	4856310300	EYE LET	BSR T0.2 (R1.6)	
E37	4856310300	EYE LET	BSR T0.2 (R1.6)	
E38	4856310300	EYE LET	BSR T0.2 (R1.6)	
E39	4856310300	EYE LET	BSR T0.2 (R1.6)	
E40	4856310300	EYE LET	BSR T0.2 (R1.6)	
E41	4856310300	EYE LET	BSR T0.2 (R1.6)	
E42	4856310300	EYE LET	BSR T0.2 (R1.6)	
E43	4856310300	EYE LET	BSR T0.2 (R1.6)	
E44	4856310300	EYE LET	BSR T0.2 (R1.6)	
E45	4856310300	EYE LET	BSR T0.2 (R1.6)	
E46	4856310300	EYE LET	BSR T0.2 (R1.6)	
E47	4856310300	EYE LET	BSR T0.2 (R1.6)	
E48	4856310300	EYE LET	BSR T0.2 (R1.6)	
E49	4856310300	EYE LET	BSR T0.2 (R1.6)	
E50	4856310300	EYE LET	BSR T0.2 (R1.6)	
E51	4856310300	EYE LET	BSR T0.2 (R1.6)	
E52	4856310600	EYE LET	BSR 2.3(R2.3)	
E53	4856310600	EYE LET	BSR 2.3(R2.3)	
E54	4856310300	EYE LET	BSR T0.2 (R1.6)	
E55	4856310300	EYE LET	BSR T0.2 (R1.6)	
E56	4856310300	EYE LET	BSR T0.2 (R1.6)	
E57	4856310300	EYE LET	BSR T0.2 (R1.6)	
E58	4856310300	EYE LET	BSR T0.2 (R1.6)	
ZZ200	PTMPJ2H2881FFL	PCB CHIP MOUNT B AS	DTH-2881FLF-S	
CC01	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC02	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC03	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC04	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC05	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC06	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC07	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC08	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC10	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC101	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC103	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC110	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC111	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC112	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC115	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC117	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC119	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC120	HCQK150JCA	C CHIP CERA	50V CH 15PF J 2012	
CC127	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC129	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC13	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC136	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC14	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC15	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC158	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC16	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC160	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC166	HCQK470JCA	C CHIP CERA	50V CH 47PF J 2012	
CC17	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC177	HCQK470JCA	C CHIP CERA	50V CH 47PF J 2012	
CC18	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC19	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
CC20	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC21	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC30	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC31	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC32	HCBK222KCA	C CHIP CERA	50V X7R 2200PF K 2012	
CC501	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC502	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC503	HCFK334ZCA	C CHIP CERA	50V Y5V 0.33MF Z 2012	
CC504	HCQK150JCA	C CHIP CERA	50V CH 15PF J 2012	
CC505	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC506	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC507	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC508	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC509	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC511	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC512	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC513	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC514	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC515	HCQK470JCA	C CHIP CERA	50V CH 47PF J 2012	
CC516	HCQK470JCA	C CHIP CERA	50V CH 47PF J 2012	
CC517	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC518	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC521	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC522	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC523	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC524	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC526	HCQK220JCA	C CHIP CERA	50V CH 22PF J 2012	
CC527	HCQK220JCA	C CHIP CERA	50V CH 22PF J 2012	
CC528	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC549	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC550	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC551	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC552	HCQK270JCA	C CHIP CERA	50V CH 27PF J 2012	
CC553	HCQK270JCA	C CHIP CERA	50V CH 27PF J 2012	
CC556	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC560	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC561	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC567	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC568	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC569	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC570	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC601	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC602	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC617	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC620	HCQK309CCA	C CHIP CERA	50V CH 3PF C 2012	
CC621	HCQK309CCA	C CHIP CERA	50V CH 3PF C 2012	
CC622	HCQK680JCA	C CHIP CERA	50V CH 68PF J 2012	
CC629	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC631	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC635	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC665	HCBK222KCA	C CHIP CERA	50V X7R 2200PF K 2012	
CC667	HCBK222KCA	C CHIP CERA	50V X7R 2200PF K 2012	
CC680	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC701	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC709	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC711	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC712	HCQK151JCA	C CHIP CERA	50V CH 150PF J 2012	
CC713	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC715	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC716	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC720	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC726	HCQK330JCA	C CHIP CERA	50V CH 33PF J 2012	
CC727	HCQK330JCA	C CHIP CERA	50V CH 33PF J 2012	
CC730	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC737	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC742	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC744	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC777	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
I501	1VSP9402AQ	IC CHIP VIDEO	VSP9402	
I502	1DDP3315CQ	IC CHIP	DDP3315CQ	
RC102	HRFT561JCA	R CHIP	1/10 560 OHM J 2012	
RC106	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC107	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC109	HRFT104JCA	R CHIP	1/10 100K OHM J 2012	
RC112	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC114	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC116	HRFT243JCA	R CHIP	1/10 24K OHM J 2012	
RC117	HRFT243JCA	R CHIP	1/10 24K OHM J 2012	
RC118	HRFT151JCA	R CHIP	1/10 150 OHM J 2012	
RC119	HRFT272JCA	R CHIP	1/10 2.7K OHM J 2012	
RC153	HRFT470JCA	R CHIP	1/10 47 OHM J 2012	
RC159	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	
RC160	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC161	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC169	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012	
RC177	HRFT562JCA	R CHIP	1/10 5.6K OHM J 2012	
RC179	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012	
RC501	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC506	HRFT750JCA	R CHIP	1/10 75 OHM J 2012	
RC513	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC516	HRFT471JCA	R CHIP	1/10 470 OHM J 2012	
RC527	HRFT333JCA	R CHIP	1/10 33K OHM J 2012	
RC530	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC532	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC550	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC551	HRFT471JCA	R CHIP	1/10 470 OHM J 2012	
RC560	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC568	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC569	HRFT151JCA	R CHIP	1/10 150 OHM J 2012	
RC580	HRFT821JCA	R CHIP	1/10 820 OHM J 2012	
RC581	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC582	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC583	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC584	HRFT821JCA	R CHIP	1/10 820 OHM J 2012	
RC585	HRFT911JCA	R CHIP	1/10 910 OHM J 2012	
RC586	HRFT911JCA	R CHIP	1/10 910 OHM J 2012	
RC587	HRFT821JCA	R CHIP	1/10 820 OHM J 2012	
RC591	HRFT393JCA	R CHIP	1/10 39K OHM J 2012	
RC595	HRFT271JCA	R CHIP	1/10 270 OHM J 2012	
RC598	HRFT271JCA	R CHIP	1/10 270 OHM J 2012	
RC602	HRFT104JCA	R CHIP	1/10 100K OHM J 2012	
RC661	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC662	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC712	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC713	HRFT391JCA	R CHIP	1/10 390 OHM J 2012	
RC715	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC718	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC720	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC721	HRFT151JCA	R CHIP	1/10 150 OHM J 2012	
RC722	HRFT241JCA	R CHIP	1/10 240 OHM J 2012	
RC723	HRFT391JCA	R CHIP	1/10 390 OHM J 2012	
RC724	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC725	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC729	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC730	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC731	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC732	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC733	HRFT473JCA	R CHIP	1/10 47K OHM J 2012	
RC734	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC735	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC736	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC737	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	
RC738	HRFT000-CA	R CHIP	1/10 0 OHM 2012	
RC739	HRFT000-CA	R CHIP	1/10 0 OHM 2012	
RC740	HRFT000-CA	R CHIP	1/10 0 OHM 2012	
RC741	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
RC742	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	
RC743	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	
RC750	HRFT183JCA	R CHIP	1/10 18K OHM J 2012	
RC770	HRFT332JCA	R CHIP	1/10 3.3K OHM J 2012	
RC790	HRFT512JCA	R CHIP	1/10 5.1K OHM J 2012	
RC799	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RCA77	HRFT750JCA	R CHIP	1/10 75 OHM J 2012	
ZZ200	PTMPJRH2881FFL	PCB MAIN RADIAL AS	DTH-2881FLF-S	
C102	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C117	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C121	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C150	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C152	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C153	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C157	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C164	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C188	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C301	CMXM2A224J	C MYLAR	100V 0.22MF J BULK	
C305	CEXF1E221V	C ELECTRO	25V RSS 220MF (8X11.5) TP	
C313	CMXM2A104J	C MYLAR	100V 0.1MF J TP	
C315	CEXF1H101V	C ELECTRO	50V RSS 100MF (8*11.5) TP	
C320	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C350	CCXF1H223Z	C CERA	50V F 0.022MF Z (TAPPING)	
C351	CCXF1H223Z	C CERA	50V F 0.022MF Z (TAPPING)	
C370	CCXF1H473Z	C CERA	50V F 0.047MF Z (TAPPING)	
C401	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C411	CEXF2C339V	C ELECTRO	160V RSS 3.3MF (8X16) TP	
C424	CMXM2A333J	C MYLAR	100V 0.033MF J TP	
C425	CCXB1H472K	C CERA	50V B 4700PF K (TAPPING)	
C500	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C501	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C502	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C503	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C504	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C505	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C524	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C530	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C550	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C551	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C560	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C561	CEXF1H339V	C ELECTRO	50V RSS 3.3MF (5X11) TP	
C568	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C590	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C602	CEXF1E221V	C ELECTRO	25V RSS 220MF (8X11.5) TP	
C605	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C608	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C610	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C611	CEXF1H339V	C ELECTRO	50V RSS 3.3MF (5X11) TP	
C612	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C613	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C614	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C615	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C616	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C623	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C624	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C625	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C626	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C630	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C634	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C636	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C641	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C642	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C660	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C661	CMXM2A224J	C MYLAR	100V 0.22MF J BULK	
C662	CMXM2A224J	C MYLAR	100V 0.22MF J BULK	
C666	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C668	CMXM2A224J	C MYLAR	100V 0.22MF J BULK	
C669	CMXM2A224J	C MYLAR	100V 0.22MF J BULK	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
C690	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5*11) TP	
C691	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5*11) TP	
C709	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C711	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C713	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C730	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C733	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C737	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C742	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C744	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C770	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C803	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	
C804	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	
C806	CEXF1H330V	C ELECTRO	50V RSS 33MF (6.3X11) TP	
C807	CCXF1H473Z	C CERA	50V F 0.047MF Z (TAPPING)	
C808	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5*11) TP	
C809	CCXB1H102K	C CERA	50V B 1000PF K (TAPPING)	
C821	CCXB1H102K	C CERA	50V B 1000PF K (TAPPING)	
C824	CCXB3A471K	C CERA	1KV B 470PF K (T)	
C831	CCXB3A471K	C CERA	1KV B 470PF K (T)	
C835	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C844	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C846	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C850	CCXB1H821K	C CERA	50V B 820PF K (TAPPING)	
C863	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C870	CCXB3A471K	C CERA	1KV B 470PF K (T)	
C876	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C880	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C888	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
F801A	4857415001	CLIP FUSE	PFC5000-0702	
F801B	4857415001	CLIP FUSE	PFC5000-0702	
L101	5CPX479K—	COIL PEAKING	4.7UH K RADIAL	
L501	5CPX479K—	COIL PEAKING	4.7UH K RADIAL	
L502	5CPX479K—	COIL PEAKING	4.7UH K RADIAL	
L802	58CX430599	COIL CHOKE	AZ-9004Y 940K TP	
Q103	T2SC5343Y-	TR	2SC5343Y	
Q104	T2SC5343Y-	TR	2SC5343Y	
Q110	T2SC5343Y-	TR	2SC5343Y	
Q150	T2SC5343Y-	TR	2SC5343Y	
Q151	T2SC5343Y-	TR	2SC5343Y	
Q333	T2SC5343Y-	TR	2SC5343Y	
Q334	T2SC5343Y-	TR	2SC5343Y	
Q402	T2SD1207T-	TR	2SD1207-T (TAPPING)	
Q501	T2SA1980Y-	TR	2SA1980Y	
Q502	T2SC5343Y-	TR	2SC5343Y	
Q542	T2SA1980Y-	TR	2SA1980Y	
Q543	T2SA1980Y-	TR	2SA1980Y	
Q544	T2SA1980Y-	TR	2SA1980Y	
Q550	T2SC5343Y-	TR	2SC5343Y	
Q601	T2SA1980Y-	TR	2SA1980Y	
Q701	T2SC5343Y-	TR	2SC5343Y	
Q702	T2SA1980Y-	TR	2SA1980Y	
Q720	TH2N7000—	TR	H2N7000	
Q721	TH2N7000—	TR	H2N7000	
Q730	T2SC5343Y-	TR	2SC5343Y	
Q731	T2SC5343Y-	TR	2SC5343Y	
Q733	T2SC5343Y-	TR	2SC5343Y	
Q734	T2SC5343Y-	TR	2SC5343Y	
Q807	T2SC5343Y-	TR	2SC5343Y	
Q808	T2SC5343Y-	TR	2SC5343Y	
Q809	T2SC5343Y-	TR	2SC5343Y	
Q810	T2SC5343Y-	TR	2SC5343Y	
Q811	T2SC5343Y-	TR	2SC5343Y	
R402	RN02B750JS	R METAL FILM	2W 75 OHM J SMALL	
R410	RN02B473JS	R METAL FILM	2W 47K OHM J SMALL	
SW700	5S50101090	SW TACT	SKHV17910A	
SW701	5S50101090	SW TACT	SKHV17910A	
SW702	5S50101090	SW TACT	SKHV17910A	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
SW703	5S50101090	SW TACT	SKHV17910A	
SW704	5S50101090	SW TACT	SKHV17910A	
X502	5XEX5R000E	CRYSTAL QUARTZ	HC-49/U 5.00MHZ 30PPM	
Z603	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z604	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
ZA20	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
ZA21	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
ZZ200	PTMPJAH2881FRL	PCB MAIN AXIAL AS	DTH-2881FLF-S	
10	2TM10006LB	TAPE MASKING	3M #232-MAP-C 6.2X2000M	
20	2TM14006LB	TAPE MASKING	3M #232 6.0X2000M	
A001	4859809493	PCB MAIN	CP-830F (DTH) 330X246	
C101	CCZB1H101K	C CERA	50V B 100PF K (AXIAL)	
C161	CCZB1H220K	C CERA	50V B 22PF K (AXIAL)	
C508	CCZB1H473K	C CERA	50V B 0.047MF K (AXIAL)	
C509	CCZB1H473K	C CERA	50V B 0.047MF K (AXIAL)	
C510	CCZB1H473K	C CERA	50V B 0.047MF K (AXIAL)	
C515	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C516	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C517	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C518	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C519	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C532	CCZB1H103K	C CERA	50V B 0.01MF K (AXIAL)	
C534	CCZB1H103K	C CERA	50V B 0.01MF K (AXIAL)	
C536	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C537	CCZB1H103K	C CERA	50V B 0.01MF K (AXIAL)	
C538	CCZB1H103K	C CERA	50V B 0.01MF K (AXIAL)	
C540	CCZB1H333K	C CERA	50V B 0.033MF K (AXIAL)	
C553	CCZB1H103K	C CERA	50V B 0.01MF K (AXIAL)	
C557	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C558	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C578	CCZB1H561K	C CERA	50V B 560PF K (AXIAL)	
C579	CCZB1H561K	C CERA	50V B 560PF K (AXIAL)	
C589	CCZB1H561K	C CERA	50V B 560PF K (AXIAL)	
C650	CZSL1H680J	C CERA	50V SL 68PF J (AXIAL)	
C712	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C830	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
CA20	CCZB1H222K	C CERA	50V B 2200PF K (AXIAL)	
D100	DTZX33B---	DIODE ZENER	TZX33B (TAPPING)	
D101	DBAT85----	DIODE	BAT85 (TAPPING)	
D103	DBA282----	DIODE	BA282	
D313	DRGP15J---	DIODE	RGP15J	
D360	DTZX22C---	DIODE ZENER	TZX22C (TAPPING)	
D361	DTZX33B---	DIODE ZENER	TZX33B (TAPPING)	
D362	DTZX33B---	DIODE ZENER	TZX33B (TAPPING)	
D367	DTZX33B---	DIODE ZENER	TZX33B (TAPPING)	
D405	D1N4937G---	DIODE	1N4937G	
D406	DRGP15J---	DIODE	RGP15J	
D407	DRGP15J---	DIODE	RGP15J	
D408	D1N4937G---	DIODE	1N4937G	
D410	D1N4937G---	DIODE	1N4937G	
D414	D1N4004S---	DIODE	1N4004S	
D415	D1N4937G---	DIODE	1N4937G	
D530	D1N4148----	DIODE	1N4148 (TAPPING)	
D531	D1N4148----	DIODE	1N4148 (TAPPING)	
D535	D1N4148----	DIODE	1N4148 (TAPPING)	
D540	D1N4148----	DIODE	1N4148 (TAPPING)	
D541	D1N4148----	DIODE	1N4148 (TAPPING)	
D550	D1N4148----	DIODE	1N4148 (TAPPING)	
D551	D1N4148----	DIODE	1N4148 (TAPPING)	
D602	D1N4148----	DIODE	1N4148 (TAPPING)	
D720	DTZX2V7A---	DIODE ZENER	TZX2V7A (TAPPING)	
D730	DTZX7V5C---	DIODE ZENER	TZX7V5C (TAPPING)	
D733	DTZX7V5C---	DIODE ZENER	TZX7V5C (TAPPING)	
D777	DTZX5V6B---	DIODE ZENER	TZX5V6B (TAPPING)	
D801	DLT2A05G---	DIODE	LT2A05G	
D802	DLT2A05G---	DIODE	LT2A05G	
D803	DLT2A05G---	DIODE	LT2A05G	
D804	DLT2A05G---	DIODE	LT2A05G	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
D805	DRGP15J---	DIODE	RGP15J	
D806	DRGP15J---	DIODE	RGP15J	
D808	DRGP15J---	DIODE	RGP15J	
D809	DRGP15J---	DIODE	RGP15J	
D811	DTZX6V2---	DIODE ZENER	TZX6V2B (TAPPING)	
D821	DRGP15J---	DIODE	RGP15J	
D824	D1N4148----	DIODE	1N4148 (TAPPING)	
D825	D1N4148----	DIODE	1N4148 (TAPPING)	
D830	DRGP15J---	DIODE	RGP15J	
D831	DRGP15J---	DIODE	RGP15J	
D840	D1N4004S---	DIODE	1N4004S	
D841	D1N4004S---	DIODE	1N4004S	
D870	DRGP15J---	DIODE	RGP15J	
DA11	DTZX5V6B---	DIODE ZENER	TZX5V6B (TAPPING)	
DA16	DTZX5V6B---	DIODE ZENER	TZX5V6B (TAPPING)	
DA17	DTZX5V6B---	DIODE ZENER	TZX5V6B (TAPPING)	
DA20	DTZX5V6B---	DIODE ZENER	TZX5V6B (TAPPING)	
DA27	DTZX5V6B---	DIODE ZENER	TZX5V6B (TAPPING)	
J047	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J112	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J125	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J128	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J130	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J135	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J136	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J142	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J143	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J145	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J154	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J156	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J159	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J201	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J220	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J232	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J234	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J235	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J236	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J240	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J243	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J267	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J276	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J278	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J287	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J288	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J289	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J290	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J291	RD-4Z100J-	R CARBON FILM	1/4 10 OHM J	
J300	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J301	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J305	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J306	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J307	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J308	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J309	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J310	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J311	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J312	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J313	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J315	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J317	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J320	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J321	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J322	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J324	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J325	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J327	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J328	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J329	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
J330	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J331	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J332	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J333	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J334	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J335	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J336	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J339	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J340	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J341	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J342	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J344	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J345	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J347	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J348	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J350	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J351	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J353	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J354	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J355	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J356	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J357	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J358	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J359	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J362	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J363	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J365	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J366	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J367	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J368	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J369	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J371	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J373	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J374	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J375	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J377	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J378	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J379	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J380	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J381	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J382	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J383	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J385	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J387	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J388	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J389	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J390	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J391	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J392	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J394	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J396	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J397	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J398	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J399	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J400	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J401	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J403	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J404	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J405	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J406	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J407	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J408	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J409	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J410	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J411	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J413	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J414	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J416	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
J417	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J418	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J419	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J420	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J423	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J426	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J427	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J429	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J430	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J431	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J432	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J433	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J434	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J435	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J440	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J450	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J453	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J460	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J483	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J488	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J889	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
L105	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L153	5CPZ120K02	COIL PEAKING	12UH 3.5MM K (LAL02TB)	
L402	5MC0000100	COIL BEAD	MD-5 (HC-3550)	
L506	5CPZ479K04	COIL PEAKING	4.7UH 10.5MM K (LAL04TB)	
L507	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L524	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L551	5CPZ479K04	COIL PEAKING	4.7UH 10.5MM K (LAL04TB)	
L568	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L601	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L602	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L603	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L605	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L650	5MC0000100	COIL BEAD	MD-5 (HC-3550)	
L709	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L711	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L713	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L730	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L737	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L742	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L744	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L801	5MC0000100	COIL BEAD	MD-5 (HC-3550)	
LA01	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA02	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA03	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA04	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA06	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA07	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA08	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA09	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
R103	RD-AZ123J-	R CARBON FILM	1/6 12K OHM J	
R110	RN-4Z1502F	R METAL FILM	1/4 15K OHM F	
R111	RD-AZ133J-	R CARBON FILM	1/6 13K OHM J	
R150	RD-AZ561J-	R CARBON FILM	1/6 560 OHM J	
R151	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R152	RD-AZ271J-	R CARBON FILM	1/6 270 OHM J	
R154	RD-AZ470J-	R CARBON FILM	1/6 47 OHM J	
R155	RD-AZ751J-	R CARBON FILM	1/6 750 OHM J	
R162	RD-AZ153J-	R CARBON FILM	1/6 15K OHM J	
R163	RD-AZ752J-	R CARBON FILM	1/6 7.5K OHM J	
R164	RD-AZ752J-	R CARBON FILM	1/6 7.5K OHM J	
R190	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
R191	RD-AZ331J-	R CARBON FILM	1/6 330 OHM J	
R301	RD-4Z472J-	R CARBON FILM	1/4 4.7K OHM J	
R310	RD-AZ432J-	R CARBON FILM	1/6 4.3K OHM J	
R311	RD-AZ432J-	R CARBON FILM	1/6 4.3K OHM J	
R333	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
R334	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
R345	RD-4Z473J-	R CARBON FILM	1/4 47K OHM J	
R350	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
R351	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
R370	RD-4Z159J-	R CARBON FILM	1/4 1.5 OHM J	
R394	RD-AZ272J-	R CARBON FILM	1/6 2.7K OHM J	
R395	RD-4Z564J-	R CARBON FILM	1/4 560K OHM J	
R396	RD-AZ272J-	R CARBON FILM	1/6 2.7K OHM J	
R397	RD-AZ823J-	R CARBON FILM	1/6 82K OHM J	
R407	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
R414	RD-AZ681J-	R CARBON FILM	1/6 680 OHM J	
R416	RD-4Z471J-	R CARBON FILM	1/4 470 OHM J	
R420	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R424	RD-4Z472J-	R CARBON FILM	1/4 4.7K OHM J	
R430	RD-4Z152J-	R CARBON FILM	1/4 1.5K OHM J	
R501	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R502	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R504	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R507	RD-AZ562J-	R CARBON FILM	1/6 5.6K OHM J	
R509	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R510	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R511	RD-AZ330J-	R CARBON FILM	1/6 33 OHM J	
R512	RD-AZ330J-	R CARBON FILM	1/6 33 OHM J	
R513	RD-AZ330J-	R CARBON FILM	1/6 33 OHM J	
R514	RD-AZ151J-	R CARBON FILM	1/6 150 OHM J	
R515	RD-AZ223J-	R CARBON FILM	1/6 22K OHM J	
R518	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
R519	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
R520	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
R524	RD-AZ391J-	R CARBON FILM	1/6 390 OHM J	
R525	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R533	RD-AZ392J-	R CARBON FILM	1/6 3.9K OHM J	
R534	RD-AZ391J-	R CARBON FILM	1/6 390 OHM J	
R535	RD-AZ122J-	R CARBON FILM	1/6 1.2K OHM J	
R537	RD-AZ301J-	R CARBON FILM	1/6 300 OHM J	
R538	RD-AZ301J-	R CARBON FILM	1/6 300 OHM J	
R540	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R545	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
R551	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R563	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R564	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R566	RD-AZ220J-	R CARBON FILM	1/6 22 OHM J	
R570	RD-AZ271J-	R CARBON FILM	1/6 270 OHM J	
R576	RD-AZ151J-	R CARBON FILM	1/6 150 OHM J	
R577	RD-AZ151J-	R CARBON FILM	1/6 150 OHM J	
R578	RD-AZ330J-	R CARBON FILM	1/6 33 OHM J	
R579	RD-AZ330J-	R CARBON FILM	1/6 33 OHM J	
R580	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R588	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R589	RD-AZ330J-	R CARBON FILM	1/6 33 OHM J	
R590	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R593	RD-AZ203J-	R CARBON FILM	1/6 20K OHM J	
R594	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R595	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R599	RD-AZ151J-	R CARBON FILM	1/6 150 OHM J	
R605	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R606	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R608	RD-2Z151J-	R CARBON FILM	1/2 150 OHM J	
R609	RD-2Z151J-	R CARBON FILM	1/2 150 OHM J	
R614	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R615	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R620	RD-AZ242J-	R CARBON FILM	1/6 2.4K OHM J	
R621	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R622	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R641	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R642	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R646	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R647	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R649	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
R650	RD-AZ682J-	R CARBON FILM	1/6 6.8K OHM J	
R651	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R652	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R660	RD-AZ682J-	R CARBON FILM	1/6 6.8K OHM J	
R666	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R680	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R700	RD-2Z332J-	R CARBON FILM	1/2 3.3K OHM J	
R701	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R702	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R703	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R704	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R708	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R709	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R710	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R716	RD-AZ113J-	R CARBON FILM	1/6 11K OHM J	
R718	RN-AZ3902F	R METAL FILM	1/6 39K OHM F	
R720	RD-AZ681J-	R CARBON FILM	1/6 680 OHM J	
R733	RD-AZ223J-	R CARBON FILM	1/6 22K OHM J	
R741	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R748	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R750	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R781	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
R786	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R787	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R788	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R789	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R790	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R791	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R805	RD-2Z100J-	R CARBON FILM	1/2 10 OHM J	
R806	RD-2Z472J-	R CARBON FILM	1/2 4.7K OHM J	
R807	RD-2Z272J-	R CARBON FILM	1/2 2.7K OHM J	
R808	RD-2Z821J-	R CARBON FILM	1/2 820 OHM J	
R810	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R811	RC-2Z565KP	R CARBON COMP	1/2 5.6M OHM K	
R817	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R820	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R821	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R823	RD-4Z472J-	R CARBON FILM	1/4 4.7K OHM J	
R829	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R830	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
R841	RD-2Z470J-	R CARBON FILM	1/2 47 OHM J	
R855	RD-4Z225J-	R CARBON FILM	1/4 2.2M OHM J	
R870	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
RA01	RD-AZ220J-	R CARBON FILM	1/6 22 OHM J	
RA15	RD-AZ680J-	R CARBON FILM	1/6 68 OHM J	
RA16	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA32	RD-AZ680J-	R CARBON FILM	1/6 68 OHM J	
RA35	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA77	RD-AZ680J-	R CARBON FILM	1/6 68 OHM J	
RA88	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
ZZ400	PTCPMSH2881FFL	PCB CRT MANUAL AS	DTH-2881FLF-S	
C900	CCXB3D102K	C CERA	2KV B 1000 PF K (TAPPING)	
C910	CEXF2E479V	C ELECTRO	250V RSS 4.7MF (10X16)TP	
C997	CEXF2E100V	C ELECTRO	250V RSS 10MF (10X20) TP	
G900	4SG0DY0001	SPARK GAP	SSG-102-A1(1.0KV) BULK	
I901	1TDA6108JF	IC VIDEO	TDA6108JF	
I901A	4857025401	HEAT SINK	A1050P-H24 T2	
I901B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN	
P401A	4859231820	CONN WAFER	YW025-05	
P501A	4859235120	CONN WAFER	YW025-08	
P903	4859238620	CONN WAFER	YPW500-02	
R906	RF01Y399JA	R FUSIBLE	1W 3.9 OHM J A CURVE	
SCT1	4859303530	SOCKET CRT	PCS629-03C	
ZZ200	PTCPJRH28W8FP	PCB CRT RADIAL AS	DTH-28W8FZP	
C902	CMXL2E104K	C MYLAR	250V 0.1MF K MEU TP	
C921	CMXM2A102J	C MYLAR	100V 1000PF J TP	
C922	CMXM2A102J	C MYLAR	100V 1000PF J TP	
C923	CMXM2A102J	C MYLAR	100V 1000PF J TP	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
Q921	TBF423——	TR	BF423 TO-92	
Q922	TBF423——	TR	BF423 TO-92	
Q923	TBF423——	TR	BF423 TO-92	
ZZ200	PTCPJAH28W8FP	PCB CRT AXIAL AS	DTH-28W8FZP	
A001	4859829013	PCB CRT	CP-830 (DTG-28)	
D911	D1N4004S—	DIODE	1N4004S	
D912	D1N4004S—	DIODE	1N4004S	
D913	D1N4004S—	DIODE	1N4004S	
D921	D1N4004S—	DIODE	1N4004S	
D922	D1N4004S—	DIODE	1N4004S	
D923	D1N4004S—	DIODE	1N4004S	
D997	DLT2A05G—	DIODE	LT2A05G	
R901	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R902	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R903	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R911	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R912	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R913	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R921	RC-2Z102K-	R CARBON COMP	1/2 1K OHM K	
R922	RC-2Z102K-	R CARBON COMP	1/2 1K OHM K	
R923	RC-2Z102K-	R CARBON COMP	1/2 1K OHM K	
R931	RD-AZ333J-	R CARBON FILM	1/6 33K OHM J	
R932	RD-AZ333J-	R CARBON FILM	1/6 33K OHM J	
R933	RD-AZ333J-	R CARBON FILM	1/6 33K OHM J	
R996	RD-2Z105J-	R CARBON FILM	1/2 1M OHM J	
R997	RD-2Z102J-	R CARBON FILM	1/2 1K OHM J	
ZZ140	PTPKCPH2881FLS	PACKING AS	DTH-2881FLF-S	
M681	2TP06575CL	TAPE OPP	T0.065XW75X500M CLEAR	
M801	GPBBW581022	BOX	DWF-2881	
M811	4858101300UP	PAD UP	2881	
M811A	4858101300DN	PAD DOWN	2881	
M822	4858215601	"POLY BAG 25""-28"" "	PE FOAM T0.5X1600X1270	

6.2 DTH-29U7FLF-S

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
ZZ100	PTACPWH29U7FLS	ACCESSORY AS	DTH-29U7FLF-S	
12000	48B4846G2201	TRANSMITTER REMOCON	R-46G22 (AAA)	
13000	4850Q00910	BATTERY	AAA R03/NN SUPERGARD	
14000	4858213801	BAG INSTRUCTION	L. D. P. E. T0. 05X250X40	
ZZ120	PTBCSHH29U7S	COVER BACK AS	DTH-29U7FLF-S	
M211	4852163301	COVER BACK	29U7 HIPS GY	
M211D	4857817610	CLOTH BLACK	"300 MM 20"" "	
M541	4855415800	S/PLATE	150ART P/E FILM (C/TV)	
M542	485580002207	LABEL SERIAL	ART 90	
ZZ130	PTCACAH29U7FFLS	CABINET AS	DTH-29U7FLF-S	
M211A	7172401612	SCREW TAPPING	TT2 TRS 4X16 MFZN BK	
M211B	7178301212	SCREW TAPPITE	TT2 WAS 3X12 MFZN BK	
M211C	4856013600	SCREW SPKR FIX	SWRM+SECC	
M352	4853535600	HOLDER CORD	NYROLN 66	
M481	4854864501	BUTTON POWER	29U7 (SILVER)	
M481A	4856716000	SPRING	14Q1/M3 SWPA PIE0.5	
M491	4851950201	BUTTON CTRL AS	29U7 4955401+5549601	
M491A	7178301011	SCREW TAPPING	TT2 WAS 3X10 MFZN	
M561	48556174SD01	MARK BRAND	"DAEWOO 28"" BLACK "	
M681	4856812001	TIE CABLE	NYLON66 DA100	
M682	4856816300	CLAMP WIRE	NYLON 6 (V0)	
P405	4850704N07	CONNECTOR	SE100J+172792+USW=500	
PWC1	4859903511	CORD POWER	CW4232 H03VVH2-F=2250	
SP01A	7172401212	SCREW TAPPING	TT2 TRS 4X12 MFZN	
SP02A	7172401212	SCREW TAPPING	TT2 TRS 4X12 MFZN	
V901	4859640560	"CRT (PHILIPS 29"") "	A68ERF012X044	
V901A	4856215402	WASHER RUBBER	20"	
V901B	4856015820	SCREW CRT FIX	SWRM+SK5 L=35	
ZZ131	58G0000149	COIL DEGAUSSING	DC-29SF	
ZZ132	48519A4210	CRT GROUND NET	2901H-1015-2P	
ZZ200	PTFMSJH29U7S	MASK FRONT AS	DTH-29U7FLF-S	
M201	4852083901	MASK FRONT	29U7 (SILVER)	
ZZ201	PTSPPWD830	SPEAKER AS	DTG-28A7FZF	
51000	4858311110	SPEAKER	12W 8 OHM SP-58126F	
51100	4850704S30	CONN AS	YH025-04+35098+ULW=700	
52000	4858311110	SPEAKER	12W 8 OHM SP-58126F	
ZZ206	PTFPMSH28W8FP	PCB FILTER MANUAL AS	DTH-28W8FZP	
CF802	CL1UC3474M	C LINE ACROSS	0.47MF 1J(UCVSNDF/SV	
LF200	5PS2901N2-	FILTER PFC CHOKE	B82991-S2901-N2	
PF01A	4859238620	CONN WAFER	YPW500-02	
PF02A	4859238620	CONN WAFER	YPW500-02	
PF02B	4850702N08	CONN AS	YPH500-02+YLT500+USW=300	
PF802	4859242220	CONN WAFER	YFW800-02	
RF801	DPC7R0M290	POSISTOR	96709 (BC)	
ZZ200	PTFPJBH28W8FP	PCB FILTER EYE LET A	DTH-28W8FZP	
A001	4859811824	PCB FILTER	CP-810100X50(246X246/1X8)	
E804	4856310300	EYE LET	BSR T0.2 (R1.6)	
E805	4856310300	EYE LET	BSR T0.2 (R1.6)	
E806	4856310300	EYE LET	BSR T0.2 (R1.6)	
E807	4856310300	EYE LET	BSR T0.2 (R1.6)	
E808	4856310300	EYE LET	BSR T0.2 (R1.6)	
E809	4856310300	EYE LET	BSR T0.2 (R1.6)	
E810	4856310300	EYE LET	BSR T0.2 (R1.6)	
E811	4856310300	EYE LET	BSR T0.2 (R1.6)	
E812	4856310300	EYE LET	BSR T0.2 (R1.6)	
E813	4856310300	EYE LET	BSR T0.2 (R1.6)	
E814	4856310300	EYE LET	BSR T0.2 (R1.6)	
ZZ290	PTMPMSH29U7FFL	PCB MAIN MANUAL AS	DTH-29U7FLF-S	
10	2193100801	SOLDER BAR	SN:PB=63:37 3PI(NO FLUX)	
40	2291050314	FLUX SOLVENT	IM-1000	
20	2193011101	SOLDER WIRE	RS 60-1.2 1.6A	
30	2291050617P	FLUX SOLDER	CF-329D	
60	2291051001	FLUX KILLER	KFT-7	
C106	CEXF1H221V	C ELECTRO	50V RSS 220MF (10X16) TP	
C118	CMXL1J474J	C MYLAR	63V 0.47MF MKT	
C404	CMYH3C113J	C MYLAR	1.6KV 0.011MF J	
C405	CMYE2J183J	C MYLAR	630V PU 0.018MF J	
C408	CMYE2G334J	C MYLAR	400V 0.33MF J	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
C415	CEXF2E100V	C ELECTRO	250V RSS 10MF (10X20) TP	
C416	CCYR3D471K	C CERA	HIKR 2KV 470PF K 125C	
C417	CMYE2G103J	C MYLAR	400V PU 0.01MF J	
C418	CEYD1H689W	C ELECTRO	50V RHD 6.8MF (16X35.5)	
C604	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
C805	CEYN2G181P	C ELECTRO	400V LHS 180MF (25X35)	
C811	CCYR3D221K	C CERA	2KV R 220PF K 125C	
C812	CH1BFE472M	C CERA AC	AC400V 4700PF M U/C/V	
C813	CEXF2E101V	C ELECTRO	250V RSS 100MF 18X35.5	
C814	CEYF2E470V	C ELECTRO	250V RSS 47MF (16X25	
C820	CCYR3A471K	C CERA	1KV 470PF K 125C	
C823	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
C832	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
C840	CEXF1C332V	C ELECTRO	16V RSS 3300MF	
C841	CEXF1C222V	C ELECTRO	16V RSS 2200MF(13X25)TP	
C845	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
C861	CEXF1E102C	C ELECTRO	25V RUS 1000MF 13X20 TP	
C866	CCYR3A471K	C CERA	1KV 470PF K 125C	
C871	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
D404	DFMP3FU—	DIODE	FMP3FU	
D404A	4857027611	HEAT SINK	AL EX BK	
D404B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
D820	DBYW76——	DIODE	BYW76	
D860	DBYW76——	DIODE	BYW76	
F801	5FSCB4022R	FUSE CERA	SEMKO F4AH 4A 250V MF51	
I101	1TDA4470M-	IC IF	TDA4470-M	
I301	1TDA8358J-	IC VERTICAL	TDA8358J	
I301A	4857028227	HEAT SINK	AL EX ANODIZING	
I301B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN	
I601	1MSP3411V3	IC SOUND	MSP3411G-PP-B8-V3	
I602	1TDA8946J-	IC AUDIO	TDA8946J	
I602A	4857028215	HEAT SINK	AL EX NO ANODOZING	
I602B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN	
I701	1SDA555XFL	IC MICOM OTP	SDA555XFL	
I702	1AT24C16PC	IC MEMORY	AT24C16-10PC	
I703	1TSOP1238W	IC PREAMP	TSOP1238WI1	
I801	1STRF6654-	IC SMPS	STR-F6654	
I801A	4857027920	HEAT SINK	AL EX NO ANODIZING	
I801B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
I804	1KP1010C—	IC PHOTO COUPLER	KP-1010C	
I806	1DP130——	IC ERROR AMP	DP130	
I810	TX0202DA—	THYRISTOR	X0202DA	
I820	1L7805CV—	IC REGULATOR	L7805CV	
I821	1LD1117V33	IC REGULATOR	LD1117AV33 3.3V TO-220	
I822	1L7808CV—	IC REGULATOR	L7808CV	
I823	1LD1117V50	IC REGULATOR	LD1117AV50 5.0V TO-220	
I824	1LD1117V18	IC REGULATOR	LD1117AV18 1.8V TO-220	
I826	1LD1117V33	IC REGULATOR	LD1117AV33 3.3V TO-220	
I827	1LD1117V25	IC REGULATOR	LD1117AV25 2.5V TO-220	
JP01	4859102130	JACK EARPHONE	YSC-1537	
JPA1	4859200401	SOCKET RGB	SR-21A1 (ANGLE TYPE)	
JPA2	4859200401	SOCKET RGB	SR-21A1 (ANGLE TYPE)	
JPA3	4859108450	JACK PIN BOARD	YSC03P-4120-14A	
JPA4	4859106740	SVHS JACK	PH-SJ-9505A	
L150	58E0000041	COIL AFT	TRF-A005	
L380	58C0000120	COIL CHOKE	CH-100Q	
L381	58C0000120	COIL CHOKE	CH-100Q	
L401	58H0000054	COIL H-LINEARITY	TRL-040F	
L403	58C0000118	COIL CHOKE	CH-191A	
LF801	5PLF24A1—	FILTER LINE	LF-24A1	
M351	4858900002	HOLDER LED AS	LH-3P	
M791	4857913304	RUBBER CUSHION	FR RUBBER SPONGE	
P401	4850705S04	CONN AS	YH025-05+YST025+ULW=400	
P402	4859242420	CONN WAFER	YFW800-04	
P501	4850708N15	CONNECTOR	YH025-08+YBNH250+USW=600	
P601	4859231720	CONN WAFER	YW025-04	
P801	4859287320	CONN WAFER	MKS2822 (LOMAX NEW TYPE)	
PF01	4859238620	CONN WAFER	YPW500-02	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
PF01B	4850702N08	CONN AS	YPH500-02+YLT500+USW=300	
PF02	4859238620	CONN WAFER	YPW500-02	
Q401	TST2310DH1	TR	ST2310DHI	
Q401A	4857027930	HEAT SINK	AL EX BK (ANODIZING)	
Q401B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
R331	RS01Y201J-	R M-OXIDE FILM	1W 200 OHM J	
R388	RW02Y508FS	R WIRE WOUND	2W 0.5 OHM F SMALL	
R399	RS02Y829JS	R M-OXIDE FILM	2W 8.2 OHM J SMALL	
R401	RS02Y820JS	R M-OXIDE FILM	2W 82 OHM J SMALL	
R415	RS02Y561JS	R M-OXIDE FILM	2W 560 OHM J SMALL	
R444	RS02Y330JS	R M-OXIDE FILM	2W 33 OHM J SMALL	
R802	RS02Y753JS	R M-OXIDE FILM	2W 75K OHM J SMALL	
R804	RF01Y158K-	R FUSIBLE	1W 0.15 OHM K	
R819	RX10B339JN	R CEMENT	10W 3.3 OHM J BENCH 4P	
R850	RS02Y129JS	R M-OXIDE FILM	2W 1.2 OHM J SMALL	
R854	RS02Y569JS	R M-OXIDE FILM	2W 5.6 OHM J SMALL	
SF1	5PK3953M—	FILTER SAW	K3953M	
SF2	5PK9650M—	FILTER SAW	K9650M	
SW801	5S40101143	SW PUSH	PS3-22SP (P.C.B)	
T401	50D25A2—-	TRANS DRIVE	TD-25A2	
T402	50H0000260	FBT	1362.5039	
T801	50M4936B4-	TRANS SMPS	2094.0074B	
U100	4859724930	TUNER VARACTOR	UV1316/AI-4	
X501	5XE20R250E	CRYSTAL QUARTZ	HC-49/U 20.2500MHZ 30PPM	
X601	5XE18R432E	CRYSTAL QUARTZ	HC-49/U 18.43200MHZ 30PPM	
X701	5XE6R0000C	CRYSTAL QUARTZ	HC-49/U 6.0000 MHZ 20PPM	
Z153	5PYXT5R5MB	FILTER CERA	XT5.5MB	
ZZ200	PTMPJBH29U7FFL	PCB MAIN EYE LET AS	DTH-29U7FLF-S	
E003	4856310600	EYE LET	BSR 2.3(R2.3)	
E004	4856310600	EYE LET	BSR 2.3(R2.3)	
E10	4856310600	EYE LET	BSR 2.3(R2.3)	
E11	4856310600	EYE LET	BSR 2.3(R2.3)	
E12	4856310600	EYE LET	BSR 2.3(R2.3)	
E13	4856310600	EYE LET	BSR 2.3(R2.3)	
E14	4856310600	EYE LET	BSR 2.3(R2.3)	
E15	4856310600	EYE LET	BSR 2.3(R2.3)	
E16	4856310600	EYE LET	BSR 2.3(R2.3)	
E17	4856310600	EYE LET	BSR 2.3(R2.3)	
E18	4856310600	EYE LET	BSR 2.3(R2.3)	
E19	4856310600	EYE LET	BSR 2.3(R2.3)	
E20	4856310600	EYE LET	BSR 2.3(R2.3)	
E21	4856310600	EYE LET	BSR 2.3(R2.3)	
E22	4856310600	EYE LET	BSR 2.3(R2.3)	
E23	4856310600	EYE LET	BSR 2.3(R2.3)	
E24	4856310600	EYE LET	BSR 2.3(R2.3)	
E25	4856310600	EYE LET	BSR 2.3(R2.3)	
E26	4856310300	EYE LET	BSR T0.2 (R1.6)	
E27	4856310300	EYE LET	BSR T0.2 (R1.6)	
E28	4856310300	EYE LET	BSR T0.2 (R1.6)	
E29	4856310300	EYE LET	BSR T0.2 (R1.6)	
E30	4856310300	EYE LET	BSR T0.2 (R1.6)	
E31	4856310300	EYE LET	BSR T0.2 (R1.6)	
E32	4856310300	EYE LET	BSR T0.2 (R1.6)	
E33	4856310300	EYE LET	BSR T0.2 (R1.6)	
E34	4856310300	EYE LET	BSR T0.2 (R1.6)	
E35	4856310300	EYE LET	BSR T0.2 (R1.6)	
E36	4856310300	EYE LET	BSR T0.2 (R1.6)	
E37	4856310300	EYE LET	BSR T0.2 (R1.6)	
E38	4856310300	EYE LET	BSR T0.2 (R1.6)	
E39	4856310300	EYE LET	BSR T0.2 (R1.6)	
E40	4856310300	EYE LET	BSR T0.2 (R1.6)	
E41	4856310300	EYE LET	BSR T0.2 (R1.6)	
E42	4856310300	EYE LET	BSR T0.2 (R1.6)	
E43	4856310300	EYE LET	BSR T0.2 (R1.6)	
E44	4856310300	EYE LET	BSR T0.2 (R1.6)	
E45	4856310300	EYE LET	BSR T0.2 (R1.6)	
E46	4856310300	EYE LET	BSR T0.2 (R1.6)	
E47	4856310300	EYE LET	BSR T0.2 (R1.6)	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
E48	4856310300	EYE LET	BSR T0.2 (R1.6)	
E49	4856310300	EYE LET	BSR T0.2 (R1.6)	
E50	4856310300	EYE LET	BSR T0.2 (R1.6)	
E51	4856310300	EYE LET	BSR T0.2 (R1.6)	
E52	4856310600	EYE LET	BSR 2.3(R2.3)	
E53	4856310600	EYE LET	BSR 2.3(R2.3)	
E54	4856310300	EYE LET	BSR T0.2 (R1.6)	
E55	4856310300	EYE LET	BSR T0.2 (R1.6)	
E56	4856310300	EYE LET	BSR T0.2 (R1.6)	
E57	4856310300	EYE LET	BSR T0.2 (R1.6)	
E58	4856310300	EYE LET	BSR T0.2 (R1.6)	
ZZ200	PTMPJ2H29U7FFL	PCB CHIP MOUNT B AS	DTH-29U7FLF-S	
CC01	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC02	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC03	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC04	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC05	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC06	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC07	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC08	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC10	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC101	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC103	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC110	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC111	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC112	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC115	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC117	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC119	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC120	HCQK150JCA	C CHIP CERA	50V CH 15PF J 2012	
CC127	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC129	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC13	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC136	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC14	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC15	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC158	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC16	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC160	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC166	HCQK470JCA	C CHIP CERA	50V CH 47PF J 2012	
CC17	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC177	HCQK470JCA	C CHIP CERA	50V CH 47PF J 2012	
CC18	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC19	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC20	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC21	HCBK471KCA	C CHIP CERA	50V X7R 470PF K 2012	
CC30	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC31	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC32	HCBK222KCA	C CHIP CERA	50V X7R 2200PF K 2012	
CC501	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC502	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC503	HCFK334ZCA	C CHIP CERA	50V Y5V 0.33MF Z 2012	
CC504	HCQK150JCA	C CHIP CERA	50V CH 15PF J 2012	
CC505	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC506	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC507	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC508	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC509	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC511	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC512	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC513	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC514	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC515	HCQK470JCA	C CHIP CERA	50V CH 47PF J 2012	
CC516	HCQK470JCA	C CHIP CERA	50V CH 47PF J 2012	
CC517	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC518	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC521	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC522	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
CC523	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC524	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC526	HCQK220JCA	C CHIP CERA	50V CH 22PF J 2012	
CC527	HCQK220JCA	C CHIP CERA	50V CH 22PF J 2012	
CC528	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC549	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC550	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC551	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC552	HCQK270JCA	C CHIP CERA	50V CH 27PF J 2012	
CC553	HCQK270JCA	C CHIP CERA	50V CH 27PF J 2012	
CC556	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC560	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC561	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC567	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC568	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC569	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC570	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC601	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC602	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC617	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC620	HCQK309CCA	C CHIP CERA	50V CH 3PF C 2012	
CC621	HCQK309CCA	C CHIP CERA	50V CH 3PF C 2012	
CC622	HCQK680JCA	C CHIP CERA	50V CH 68PF J 2012	
CC629	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC631	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC635	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC665	HCBK222KCA	C CHIP CERA	50V X7R 2200PF K 2012	
CC667	HCBK222KCA	C CHIP CERA	50V X7R 2200PF K 2012	
CC680	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC701	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC709	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC711	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC712	HCQK151JCA	C CHIP CERA	50V CH 150PF J 2012	
CC713	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC715	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC716	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC720	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC726	HCQK330JCA	C CHIP CERA	50V CH 33PF J 2012	
CC727	HCQK330JCA	C CHIP CERA	50V CH 33PF J 2012	
CC730	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
CC737	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC742	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC744	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC777	HCBK104KCA	C CHIP CERA	50V X7R 0.1MF K 2012	
I501	1VSP9402AQ	IC CHIP VIDEO	VSP9402	
I502	1DDP3315CQ	IC CHIP	DDP3315CQ	
RC102	HRFT561JCA	R CHIP	1/10 560 OHM J 2012	
RC106	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC107	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC109	HRFT104JCA	R CHIP	1/10 100K OHM J 2012	
RC112	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC114	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC116	HRFT243JCA	R CHIP	1/10 24K OHM J 2012	
RC117	HRFT243JCA	R CHIP	1/10 24K OHM J 2012	
RC118	HRFT151JCA	R CHIP	1/10 150 OHM J 2012	
RC119	HRFT272JCA	R CHIP	1/10 2.7K OHM J 2012	
RC153	HRFT470JCA	R CHIP	1/10 47 OHM J 2012	
RC159	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	
RC160	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC161	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC169	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012	
RC177	HRFT562JCA	R CHIP	1/10 5.6K OHM J 2012	
RC179	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012	
RC501	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC506	HRFT750JCA	R CHIP	1/10 75 OHM J 2012	
RC513	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC516	HRFT471JCA	R CHIP	1/10 470 OHM J 2012	
RC527	HRFT333JCA	R CHIP	1/10 33K OHM J 2012	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
RC530	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC532	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC550	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC551	HRFT471JCA	R CHIP	1/10 470 OHM J 2012	
RC560	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC568	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC569	HRFT151JCA	R CHIP	1/10 150 OHM J 2012	
RC580	HRFT821JCA	R CHIP	1/10 820 OHM J 2012	
RC581	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC582	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC583	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC584	HRFT821JCA	R CHIP	1/10 820 OHM J 2012	
RC585	HRFT911JCA	R CHIP	1/10 910 OHM J 2012	
RC586	HRFT911JCA	R CHIP	1/10 910 OHM J 2012	
RC587	HRFT821JCA	R CHIP	1/10 820 OHM J 2012	
RC591	HRFT393JCA	R CHIP	1/10 39K OHM J 2012	
RC595	HRFT271JCA	R CHIP	1/10 270 OHM J 2012	
RC598	HRFT271JCA	R CHIP	1/10 270 OHM J 2012	
RC602	HRFT104JCA	R CHIP	1/10 100K OHM J 2012	
RC661	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC662	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC712	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC713	HRFT391JCA	R CHIP	1/10 390 OHM J 2012	
RC715	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC718	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC720	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC721	HRFT151JCA	R CHIP	1/10 150 OHM J 2012	
RC722	HRFT241JCA	R CHIP	1/10 240 OHM J 2012	
RC723	HRFT391JCA	R CHIP	1/10 390 OHM J 2012	
RC724	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC725	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC729	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC730	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC731	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC732	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC733	HRFT473JCA	R CHIP	1/10 47K OHM J 2012	
RC734	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC735	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC736	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC737	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	
RC738	HRFT000-CA	R CHIP	1/10 0 OHM 2012	
RC739	HRFT000-CA	R CHIP	1/10 0 OHM 2012	
RC740	HRFT000-CA	R CHIP	1/10 0 OHM 2012	
RC741	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	
RC742	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	
RC743	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	
RC750	HRFT183JCA	R CHIP	1/10 18K OHM J 2012	
RC770	HRFT332JCA	R CHIP	1/10 3.3K OHM J 2012	
RC790	HRFT512JCA	R CHIP	1/10 5.1K OHM J 2012	
RC799	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RCA77	HRFT750JCA	R CHIP	1/10 75 OHM J 2012	
ZZ200	PTMPJRH29U7FFL	PCB MAIN RADIAL AS	DTH-29U7FLF-S	
C102	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C117	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C121	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C150	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C152	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C153	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C157	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C164	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C188	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C301	CMXM2A224J	C MYLAR	100V 0.22MF J BULK	
C305	CEXF1E221V	C ELECTRO	25V RSS 220MF (8X11.5) TP	
C313	CMXM2A104J	C MYLAR	100V 0.1MF J TP	
C315	CEXF1H101V	C ELECTRO	50V RSS 100MF (8*11.5) TP	
C320	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C350	CCXF1H223Z	C CERA	50V F 0.022MF Z (TAPPING)	
C351	CCXF1H223Z	C CERA	50V F 0.022MF Z (TAPPING)	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
C370	CCXF1H473Z	C CERA	50V F 0.047MF Z (TAPPING)	
C401	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C411	CEXF2C339V	C ELECTRO	160V RSS 3.3MF (8X16) TP	
C424	CMXM2A333J	C MYLAR	100V 0.033MF J TP	
C425	CCXB1H472K	C CERA	50V B 4700PF K (TAPPING)	
C500	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C501	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C502	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C503	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C504	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C505	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C524	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C530	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C550	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C551	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C560	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C561	CEXF1H339V	C ELECTRO	50V RSS 3.3MF (5X11) TP	
C568	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C590	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C602	CEXF1E221V	C ELECTRO	25V RSS 220MF (8X11.5) TP	
C605	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C608	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C610	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C611	CEXF1H339V	C ELECTRO	50V RSS 3.3MF (5X11) TP	
C612	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C613	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C614	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C615	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C616	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C623	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C624	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C625	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C626	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C630	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C634	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C636	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C641	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C642	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C660	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C661	CMXM2A224J	C MYLAR	100V 0.22MF J BULK	
C662	CMXM2A224J	C MYLAR	100V 0.22MF J BULK	
C666	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C668	CMXM2A224J	C MYLAR	100V 0.22MF J BULK	
C669	CMXM2A224J	C MYLAR	100V 0.22MF J BULK	
C690	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5*11) TP	
C691	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5*11) TP	
C709	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C711	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C713	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C730	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C733	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C737	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C742	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C744	CEXF1E100V	C ELECTRO	25V RSS 10MF TP	
C770	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C803	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	
C804	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	
C806	CEXF1H330V	C ELECTRO	50V RSS 33MF (6.3X11) TP	
C807	CCXF1H473Z	C CERA	50V F 0.047MF Z (TAPPING)	
C808	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5*11) TP	
C809	CCXB1H102K	C CERA	50V B 1000PF K (TAPPING)	
C821	CCXB1H102K	C CERA	50V B 1000PF K (TAPPING)	
C824	CCXB3A471K	C CERA	1KV B 470PF K (T)	
C831	CCXB3A471K	C CERA	1KV B 470PF K (T)	
C835	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C844	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C846	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C850	CCXB1H821K	C CERA	50V B 820PF K (TAPPING)	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
C863	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C870	CCXB3A471K	C CERA	1KV B 470PF K (T)	
C876	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C880	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C888	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
F801A	4857415001	CLIP FUSE	PFC5000-0702	
F801B	4857415001	CLIP FUSE	PFC5000-0702	
L101	5CPX479K—	COIL PEAKING	4.7UH K RADIAL	
L501	5CPX479K—	COIL PEAKING	4.7UH K RADIAL	
L502	5CPX479K—	COIL PEAKING	4.7UH K RADIAL	
L802	58CX430599	COIL CHOKE	AZ-9004Y 940K TP	
Q103	T2SC5343Y-	TR	2SC5343Y	
Q104	T2SC5343Y-	TR	2SC5343Y	
Q110	T2SC5343Y-	TR	2SC5343Y	
Q150	T2SC5343Y-	TR	2SC5343Y	
Q151	T2SC5343Y-	TR	2SC5343Y	
Q333	T2SC5343Y-	TR	2SC5343Y	
Q334	T2SC5343Y-	TR	2SC5343Y	
Q402	T2SD1207T-	TR	2SD1207-T (TAPPING)	
Q501	T2SA1980Y-	TR	2SA1980Y	
Q502	T2SC5343Y-	TR	2SC5343Y	
Q542	T2SA1980Y-	TR	2SA1980Y	
Q543	T2SA1980Y-	TR	2SA1980Y	
Q544	T2SA1980Y-	TR	2SA1980Y	
Q550	T2SC5343Y-	TR	2SC5343Y	
Q601	T2SA1980Y-	TR	2SA1980Y	
Q701	T2SC5343Y-	TR	2SC5343Y	
Q702	T2SA1980Y-	TR	2SA1980Y	
Q720	TH2N7000—	TR	H2N7000	
Q721	TH2N7000—	TR	H2N7000	
Q730	T2SC5343Y-	TR	2SC5343Y	
Q731	T2SC5343Y-	TR	2SC5343Y	
Q733	T2SC5343Y-	TR	2SC5343Y	
Q734	T2SC5343Y-	TR	2SC5343Y	
Q807	T2SC5343Y-	TR	2SC5343Y	
Q808	T2SC5343Y-	TR	2SC5343Y	
Q809	T2SC5343Y-	TR	2SC5343Y	
Q810	T2SC5343Y-	TR	2SC5343Y	
Q811	T2SC5343Y-	TR	2SC5343Y	
R402	RN02B750JS	R METAL FILM	2W 75 OHM J SMALL	
R410	RN02B473JS	R METAL FILM	2W 47K OHM J SMALL	
SW700	5S50101090	SW TACT	SKHV17910A	
SW701	5S50101090	SW TACT	SKHV17910A	
SW702	5S50101090	SW TACT	SKHV17910A	
SW703	5S50101090	SW TACT	SKHV17910A	
SW704	5S50101090	SW TACT	SKHV17910A	
X502	5XEX5R000E	CRYSTAL QUARTZ	HC-49/U 5.00MHZ 30PPM	
Z603	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z604	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
ZA20	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
ZA21	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
ZZ200	PTMPJAH29U7FFL	PCB MAIN AXIAL AS	DTH-29U7FLF-S	
10	2TM10006LB	TAPE MASKING	3M #232-MAP-C 6.2X2000M	
20	2TM14006LB	TAPE MASKING	3M #232 6.0X2000M	
A001	4859809493	PCB MAIN	CP-830F (DTH) 330X246	
C101	CCZB1H101K	C CERA	50V B 100PF K (AXIAL)	
C161	CCZB1H220K	C CERA	50V B 22PF K (AXIAL)	
C508	CCZB1H473K	C CERA	50V B 0.047MF K (AXIAL)	
C509	CCZB1H473K	C CERA	50V B 0.047MF K (AXIAL)	
C510	CCZB1H473K	C CERA	50V B 0.047MF K (AXIAL)	
C515	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C516	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C517	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C518	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C519	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C532	CCZB1H103K	C CERA	50V B 0.01MF K (AXIAL)	
C534	CCZB1H103K	C CERA	50V B 0.01MF K (AXIAL)	
C536	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
C537	CCZB1H103K	C CERA	50V B 0.01MF K (AXIAL)	
C538	CCZB1H103K	C CERA	50V B 0.01MF K (AXIAL)	
C540	CCZB1H333K	C CERA	50V B 0.033MF K (AXIAL)	
C553	CCZB1H103K	C CERA	50V B 0.01MF K (AXIAL)	
C557	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C558	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C578	CCZB1H561K	C CERA	50V B 560PF K (AXIAL)	
C579	CCZB1H561K	C CERA	50V B 560PF K (AXIAL)	
C589	CCZB1H561K	C CERA	50V B 560PF K (AXIAL)	
C650	CZSL1H680J	C CERA	50V SL 68PF J (AXIAL)	
C712	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
C830	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z (AXIAL)	
CA20	CCZB1H222K	C CERA	50V B 2200PF K (AXIAL)	
D100	DTZX33B---	DIODE ZENER	TZX33B (TAPPING)	
D101	DBAT85----	DIODE	BAT85 (TAPPING)	
D103	DBA282----	DIODE	BA282	
D313	DRGP15J---	DIODE	RGP15J	
D360	DTZX22C---	DIODE ZENER	TZX22C (TAPPING)	
D361	DTZX33B---	DIODE ZENER	TZX33B (TAPPING)	
D362	DTZX33B---	DIODE ZENER	TZX33B (TAPPING)	
D367	DTZX33B---	DIODE ZENER	TZX33B (TAPPING)	
D405	D1N4937G--	DIODE	1N4937G	
D406	DRGP15J---	DIODE	RGP15J	
D407	DRGP15J---	DIODE	RGP15J	
D408	D1N4937G--	DIODE	1N4937G	
D410	D1N4937G--	DIODE	1N4937G	
D414	D1N4004S--	DIODE	1N4004S	
D415	D1N4937G--	DIODE	1N4937G	
D530	D1N4148---	DIODE	1N4148 (TAPPING)	
D531	D1N4148---	DIODE	1N4148 (TAPPING)	
D535	D1N4148---	DIODE	1N4148 (TAPPING)	
D540	D1N4148---	DIODE	1N4148 (TAPPING)	
D541	D1N4148---	DIODE	1N4148 (TAPPING)	
D550	D1N4148---	DIODE	1N4148 (TAPPING)	
D551	D1N4148---	DIODE	1N4148 (TAPPING)	
D602	D1N4148---	DIODE	1N4148 (TAPPING)	
D720	DTZX2V7A--	DIODE ZENER	TZX2V7A (TAPPING)	
D730	DTZX7V5C--	DIODE ZENER	TZX7V5C (TAPPING)	
D733	DTZX7V5C--	DIODE ZENER	TZX7V5C (TAPPING)	
D777	DTZX5V6B--	DIODE ZENER	TZX5V6B (TAPPING)	
D801	DLT2A05G--	DIODE	LT2A05G	
D802	DLT2A05G--	DIODE	LT2A05G	
D803	DLT2A05G--	DIODE	LT2A05G	
D804	DLT2A05G--	DIODE	LT2A05G	
D805	DRGP15J---	DIODE	RGP15J	
D806	DRGP15J---	DIODE	RGP15J	
D808	DRGP15J---	DIODE	RGP15J	
D809	DRGP15J---	DIODE	RGP15J	
D811	DTZX6V2---	DIODE ZENER	TZX6V2B (TAPPING)	
D821	DRGP15J---	DIODE	RGP15J	
D824	D1N4148---	DIODE	1N4148 (TAPPING)	
D825	D1N4148---	DIODE	1N4148 (TAPPING)	
D830	DRGP15J---	DIODE	RGP15J	
D831	DRGP15J---	DIODE	RGP15J	
D840	D1N4004S--	DIODE	1N4004S	
D841	D1N4004S--	DIODE	1N4004S	
D870	DRGP15J---	DIODE	RGP15J	
DA11	DTZX5V6B--	DIODE ZENER	TZX5V6B (TAPPING)	
DA16	DTZX5V6B--	DIODE ZENER	TZX5V6B (TAPPING)	
DA17	DTZX5V6B--	DIODE ZENER	TZX5V6B (TAPPING)	
DA20	DTZX5V6B--	DIODE ZENER	TZX5V6B (TAPPING)	
DA27	DTZX5V6B--	DIODE ZENER	TZX5V6B (TAPPING)	
J047	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J112	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J125	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J128	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J130	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J135	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
J136	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J142	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J143	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J145	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J154	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J156	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J159	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J201	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J220	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J232	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J234	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J235	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J236	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J240	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J243	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J267	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J276	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J278	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J287	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J288	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J289	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J290	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J291	RD-4Z100J-	R CARBON FILM	1/4 10 OHM J	
J300	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J301	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J305	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J306	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J307	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J308	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J309	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J310	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J311	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J312	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J313	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J315	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J317	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J320	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J321	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J322	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J324	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J325	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J327	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J328	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J329	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J330	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J331	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J332	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J333	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J334	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J335	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J336	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J339	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J340	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J341	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J342	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J344	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J345	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J347	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J348	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J350	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J351	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J353	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J354	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J355	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J356	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J357	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J358	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J359	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
J362	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J363	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J365	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J366	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J367	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J368	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J369	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J371	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J373	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J374	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J375	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J377	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J378	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J379	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J380	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J381	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J382	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J383	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J385	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J387	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J388	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J389	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J390	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J391	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J392	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J394	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J396	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J397	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J398	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J399	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J400	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J401	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J403	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J404	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J405	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J406	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J407	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J408	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J409	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J410	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J411	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J413	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J414	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J416	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J417	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J418	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J419	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J420	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J423	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J426	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J427	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J429	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J430	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J431	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J432	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J433	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J434	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J435	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J440	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J450	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J453	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J460	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J483	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J488	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J889	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
L105	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L153	5CPZ120K02	COIL PEAKING	12UH 3.5MM K (LAL02TB)	
L402	5MC0000100	COIL BEAD	MD-5 (HC-3550)	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
L506	5CPZ479K04	COIL PEAKING	4.7UH 10.5MM K (LAL04TB)	
L507	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L524	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L551	5CPZ479K04	COIL PEAKING	4.7UH 10.5MM K (LAL04TB)	
L568	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L601	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L602	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L603	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L605	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L650	5MC0000100	COIL BEAD	MD-5 (HC-3550)	
L709	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L711	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L713	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L730	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L737	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L742	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L744	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L801	5MC0000100	COIL BEAD	MD-5 (HC-3550)	
LA01	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA02	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA03	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA04	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA06	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA07	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA08	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LA09	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
R103	RD-AZ123J-	R CARBON FILM	1/6 12K OHM J	
R110	RN-4Z1502F	R METAL FILM	1/4 15K OHM F	
R111	RD-AZ133J-	R CARBON FILM	1/6 13K OHM J	
R150	RD-AZ561J-	R CARBON FILM	1/6 560 OHM J	
R151	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R152	RD-AZ271J-	R CARBON FILM	1/6 270 OHM J	
R154	RD-AZ470J-	R CARBON FILM	1/6 47 OHM J	
R155	RD-AZ751J-	R CARBON FILM	1/6 750 OHM J	
R162	RD-AZ153J-	R CARBON FILM	1/6 15K OHM J	
R163	RD-AZ752J-	R CARBON FILM	1/6 7.5K OHM J	
R164	RD-AZ752J-	R CARBON FILM	1/6 7.5K OHM J	
R190	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
R191	RD-AZ331J-	R CARBON FILM	1/6 330 OHM J	
R301	RD-4Z472J-	R CARBON FILM	1/4 4.7K OHM J	
R310	RD-AZ432J-	R CARBON FILM	1/6 4.3K OHM J	
R311	RD-AZ432J-	R CARBON FILM	1/6 4.3K OHM J	
R333	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
R334	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
R345	RD-4Z473J-	R CARBON FILM	1/4 47K OHM J	
R350	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
R351	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
R370	RD-4Z159J-	R CARBON FILM	1/4 1.5 OHM J	
R394	RD-AZ272J-	R CARBON FILM	1/6 2.7K OHM J	
R395	RD-4Z564J-	R CARBON FILM	1/4 560K OHM J	
R396	RD-AZ272J-	R CARBON FILM	1/6 2.7K OHM J	
R397	RD-AZ823J-	R CARBON FILM	1/6 82K OHM J	
R407	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
R414	RD-AZ681J-	R CARBON FILM	1/6 680 OHM J	
R416	RD-4Z471J-	R CARBON FILM	1/4 470 OHM J	
R420	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R424	RD-4Z472J-	R CARBON FILM	1/4 4.7K OHM J	
R430	RD-4Z152J-	R CARBON FILM	1/4 1.5K OHM J	
R501	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R502	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R504	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R507	RD-AZ562J-	R CARBON FILM	1/6 5.6K OHM J	
R509	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R510	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R511	RD-AZ330J-	R CARBON FILM	1/6 33 OHM J	
R512	RD-AZ330J-	R CARBON FILM	1/6 33 OHM J	
R513	RD-AZ330J-	R CARBON FILM	1/6 33 OHM J	
R514	RD-AZ151J-	R CARBON FILM	1/6 150 OHM J	

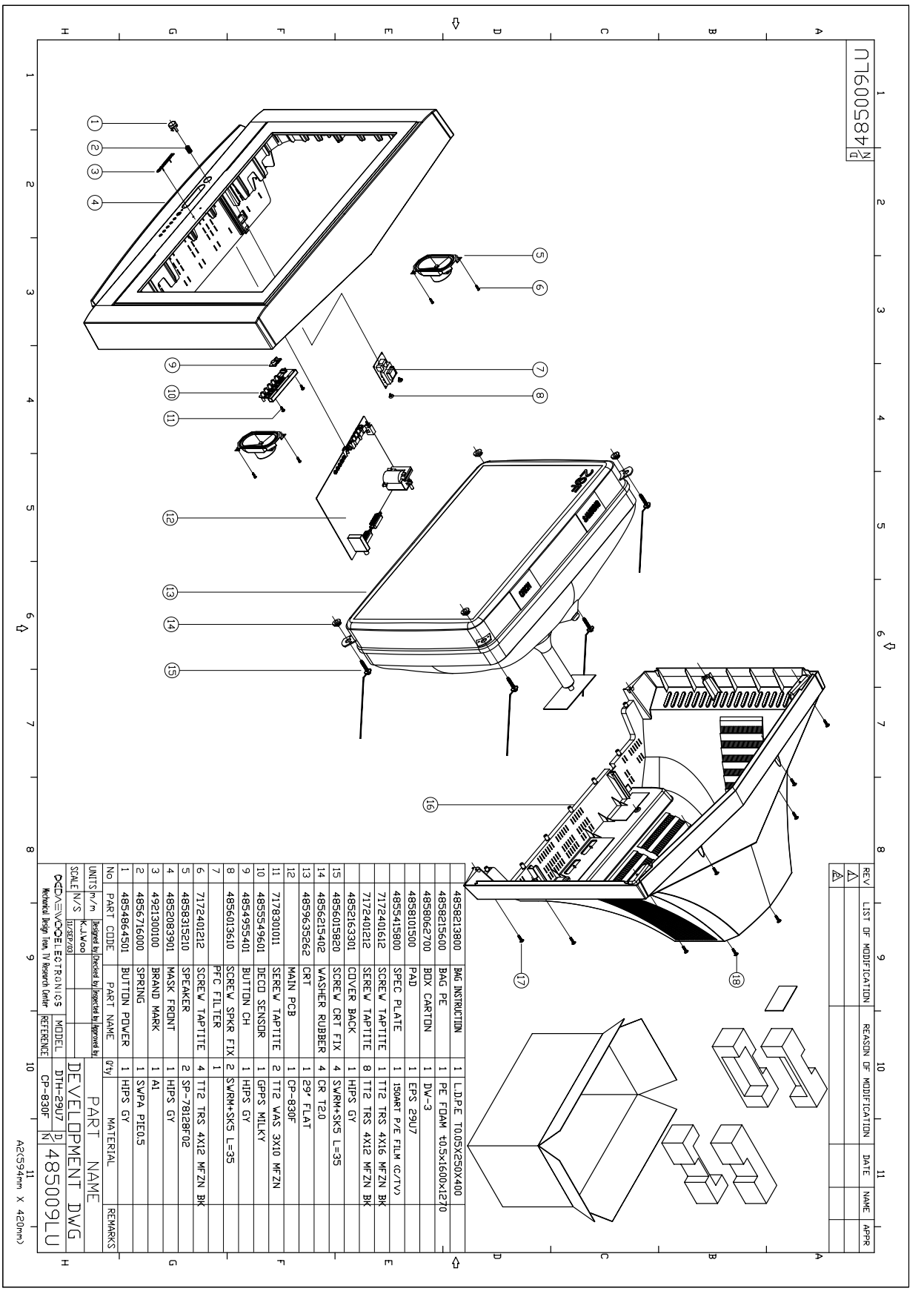
LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
R515	RD-AZ223J-	R CARBON FILM	1/6 22K OHM J	
R518	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
R519	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
R520	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
R524	RD-AZ391J-	R CARBON FILM	1/6 390 OHM J	
R525	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R533	RD-AZ392J-	R CARBON FILM	1/6 3.9K OHM J	
R534	RD-AZ391J-	R CARBON FILM	1/6 390 OHM J	
R535	RD-AZ122J-	R CARBON FILM	1/6 1.2K OHM J	
R537	RD-AZ301J-	R CARBON FILM	1/6 300 OHM J	
R538	RD-AZ301J-	R CARBON FILM	1/6 300 OHM J	
R540	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R545	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
R551	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R563	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R564	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R566	RD-AZ220J-	R CARBON FILM	1/6 22 OHM J	
R570	RD-AZ271J-	R CARBON FILM	1/6 270 OHM J	
R576	RD-AZ151J-	R CARBON FILM	1/6 150 OHM J	
R577	RD-AZ151J-	R CARBON FILM	1/6 150 OHM J	
R578	RD-AZ330J-	R CARBON FILM	1/6 33 OHM J	
R579	RD-AZ330J-	R CARBON FILM	1/6 33 OHM J	
R580	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R588	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R589	RD-AZ330J-	R CARBON FILM	1/6 33 OHM J	
R590	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R593	RD-AZ203J-	R CARBON FILM	1/6 20K OHM J	
R594	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R595	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R599	RD-AZ151J-	R CARBON FILM	1/6 150 OHM J	
R605	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R606	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R608	RD-2Z151J-	R CARBON FILM	1/2 150 OHM J	
R609	RD-2Z151J-	R CARBON FILM	1/2 150 OHM J	
R614	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R615	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R620	RD-AZ242J-	R CARBON FILM	1/6 2.4K OHM J	
R621	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R622	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R641	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R642	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R646	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R647	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R649	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R650	RD-AZ682J-	R CARBON FILM	1/6 6.8K OHM J	
R651	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R652	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R660	RD-AZ682J-	R CARBON FILM	1/6 6.8K OHM J	
R666	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R680	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R700	RD-2Z332J-	R CARBON FILM	1/2 3.3K OHM J	
R701	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R702	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R703	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R704	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R708	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R709	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R710	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R716	RD-AZ113J-	R CARBON FILM	1/6 11K OHM J	
R718	RN-AZ3902F	R METAL FILM	1/6 39K OHM F	
R720	RD-AZ681J-	R CARBON FILM	1/6 680 OHM J	
R733	RD-AZ223J-	R CARBON FILM	1/6 22K OHM J	
R741	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R748	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R750	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R781	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
R786	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R787	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
R788	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R789	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R790	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R791	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R805	RD-2Z100J-	R CARBON FILM	1/2 10 OHM J	
R806	RD-2Z472J-	R CARBON FILM	1/2 4.7K OHM J	
R807	RD-2Z272J-	R CARBON FILM	1/2 2.7K OHM J	
R808	RD-2Z821J-	R CARBON FILM	1/2 820 OHM J	
R810	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R811	RC-2Z565KP	R CARBON COMP	1/2 5.6M OHM K	
R817	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R820	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R821	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R823	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R829	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R830	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
R841	RD-2Z470J-	R CARBON FILM	1/2 47 OHM J	
R855	RD-4Z225J-	R CARBON FILM	1/4 2.2M OHM J	
R870	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
RA01	RD-AZ220J-	R CARBON FILM	1/6 22 OHM J	
RA15	RD-AZ680J-	R CARBON FILM	1/6 68 OHM J	
RA16	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA32	RD-AZ680J-	R CARBON FILM	1/6 68 OHM J	
RA35	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA77	RD-AZ680J-	R CARBON FILM	1/6 68 OHM J	
RA88	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
ZZ400	PTCPMSH29U7FFL	PCB CRT MANUAL AS	DTH-29U7FLF-S	
C900	CCXB3D102K	C CERA	2KV B 1000 PF K (TAPPING)	
C910	CEXF2E479V	C ELECTRO	250V RSS 4.7MF (10X16)TP	
C997	CEXF2E100V	C ELECTRO	250V RSS 10MF (10X20) TP	
G900	4SG0DY0001	SPARK GAP	SSG-102-A1(1.0KV) BULK	
I901	1TDA6108JF	IC VIDEO	TDA6108JF	
I901A	4857025401	HEAT SINK	A1050P-H24 T2	
I901B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN	
P401A	4859231820	CONN WAFER	YW025-05	
P501A	4859235120	CONN WAFER	YW025-08	
P903	4859238620	CONN WAFER	YPW500-02	
R906	RF01Y629JA	R FUSIBLE	1W 6.2 OHM J A CURVE	
SCT1	4859303530	SOCKET CRT	PCS629-03C	
ZZ200	PTCPJRH28W8FP	PCB CRT RADIAL AS	DTH-28W8FZP	
C902	CMXL2E104K	C MYLAR	250V 0.1MF K MEU TP	
C921	CMXM2A102J	C MYLAR	100V 1000PF J TP	
C922	CMXM2A102J	C MYLAR	100V 1000PF J TP	
C923	CMXM2A102J	C MYLAR	100V 1000PF J TP	
Q921	TBF423——	TR	BF423 TO-92	
Q922	TBF423——	TR	BF423 TO-92	
Q923	TBF423——	TR	BF423 TO-92	
ZZ200	PTCPJAH28W8FP	PCB CRT AXIAL AS	DTH-28W8FZP	
A001	4859829013	PCB CRT	CP-830 (DTG-28)	
D911	D1N4004S—	DIODE	1N4004S	
D912	D1N4004S—	DIODE	1N4004S	
D913	D1N4004S—	DIODE	1N4004S	
D921	D1N4004S—	DIODE	1N4004S	
D922	D1N4004S—	DIODE	1N4004S	
D923	D1N4004S—	DIODE	1N4004S	
D997	DLT2A05G—	DIODE	LT2A05G	
R901	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R902	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R903	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R911	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R912	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R913	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R921	RC-2Z102K-	R CARBON COMP	1/2 1K OHM K	
R922	RC-2Z102K-	R CARBON COMP	1/2 1K OHM K	
R923	RC-2Z102K-	R CARBON COMP	1/2 1K OHM K	
R931	RD-AZ333J-	R CARBON FILM	1/6 33K OHM J	
R932	RD-AZ333J-	R CARBON FILM	1/6 33K OHM J	
R933	RD-AZ333J-	R CARBON FILM	1/6 33K OHM J	

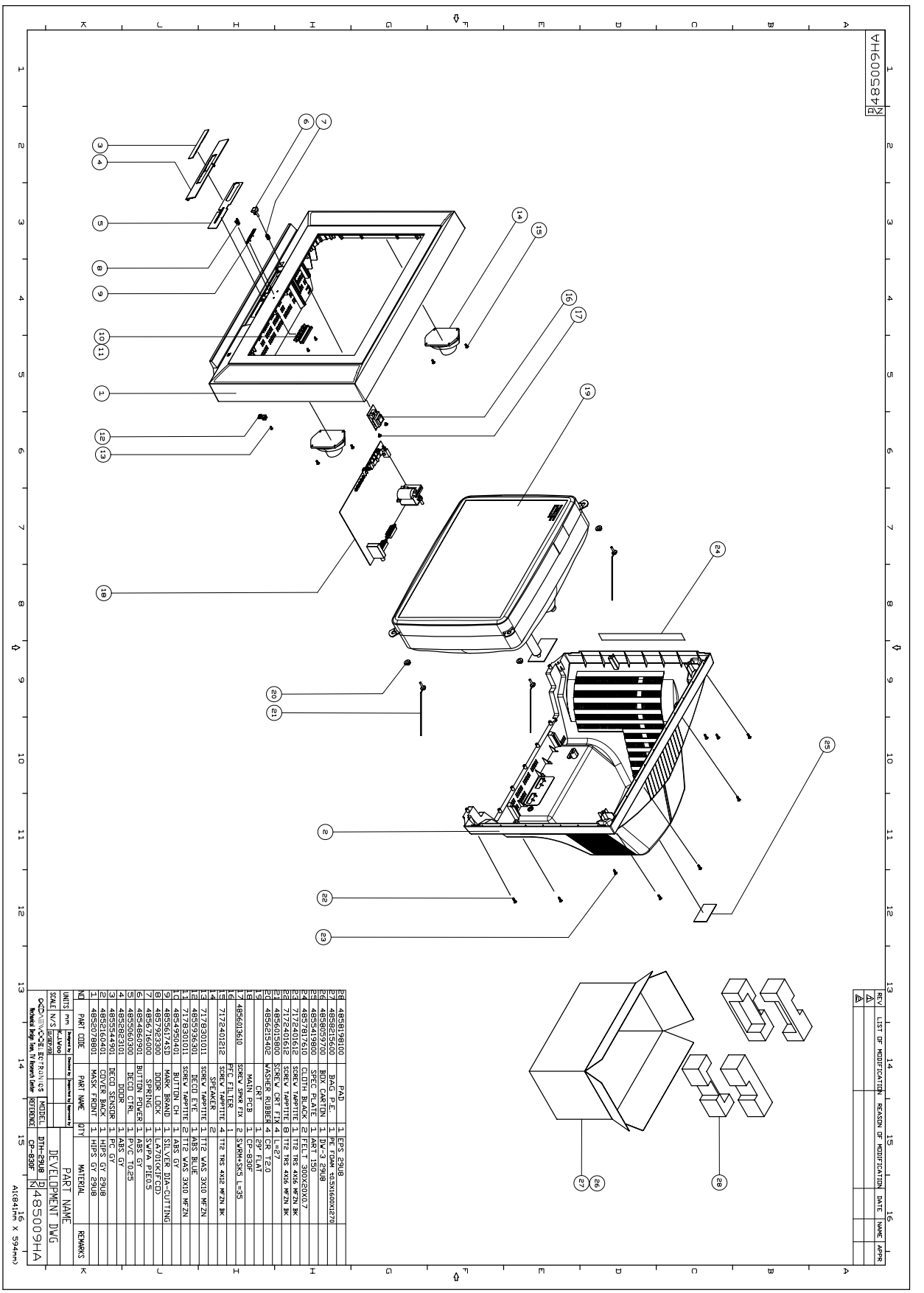
LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
R996	RD-2Z105J-	R CARBON FILM	1/2 1M OHM J	
R997	RD-2Z102J-	R CARBON FILM	1/2 1K OHM J	
ZZ140	PTPKCPH29U7FLS	PACKING AS	DTH-29U7FLF-S	
M681	2TP06575CL	TAPE OPP	T0.065XW75X500M CLEAR	
M801	GPBBW6U7022	BOX	DTF-29U7	
M811	4858101500UP	PAD UP	29U7	
M811A	4858101500DN	PAD DOWN	29U7	
M822	4858215601	"POLY BAG 25""-28"" "	PE FOAM T0.5X1600X1270	

7. EXPLODED VIEW

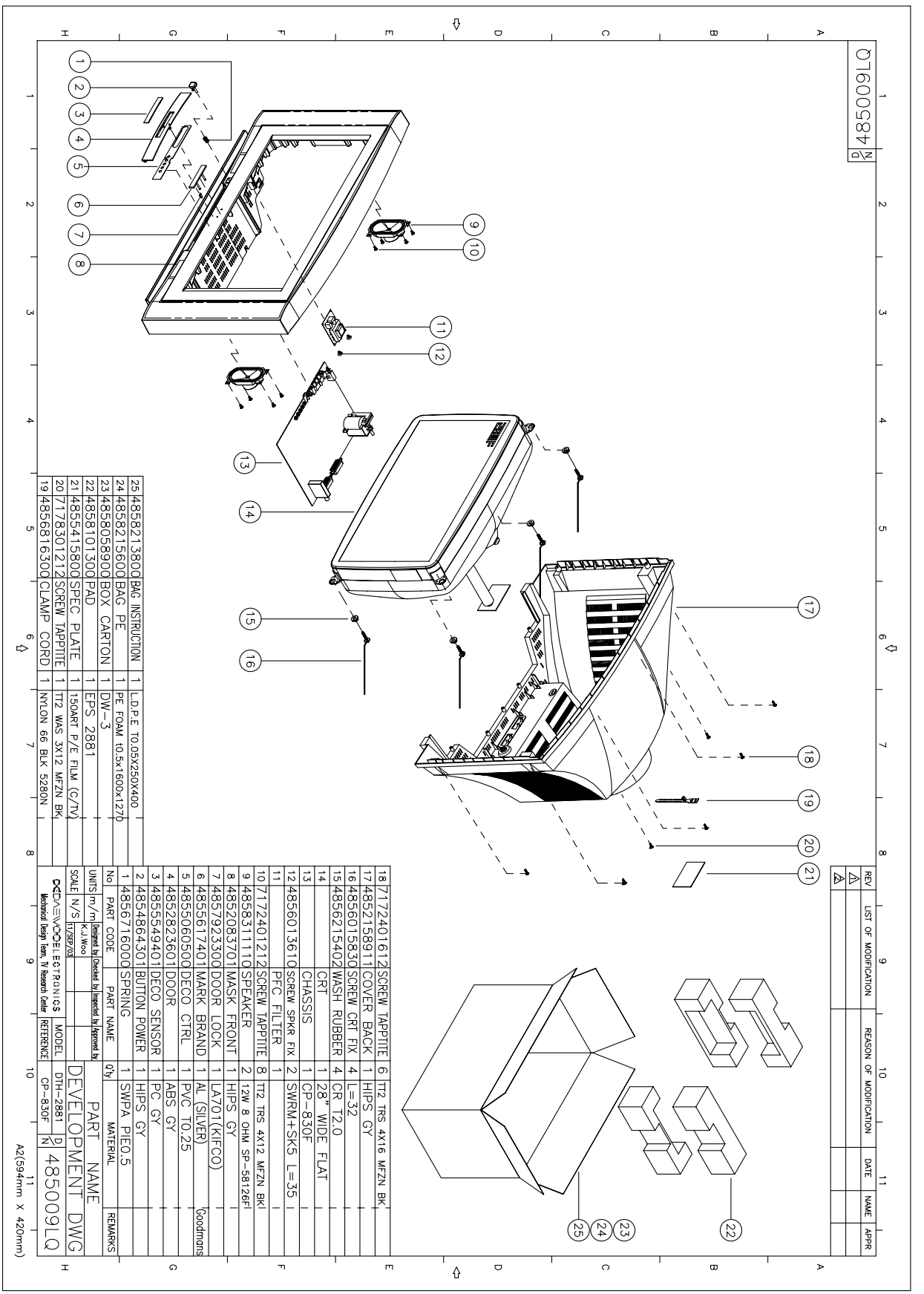
7.1 DTH-29U7


4858213800 BAG INSTRUCTION 1 L.D.P.E T0.05X250X400
4858215600 BAG PE 1 PE FOAM t0.5x1600x1270
4858062700 BOX CARTON 1 DW-3
4858101500 PAD 1 EPS 29U7
4855415800 SPEC PLATE 1 150ART P/E FILM (C/TV)
7172401612 SCREW TAPTITE 1 TT2 TRS 4X16 MFZN BK
7172401212 SCREW TAPTITE 8 TT2 TRS 4X12 MFZN BK
4952163301 CDVER BACK 1 HIPS GY
4856015820 SCREW CRT FIX 4 SWRM+SK5 L=35
4856215402 WASHER RUBBER 4 CR T2.0
4859635262 CRT 1 29" FLAT
7178301011 SCREW TAPTITE 2 TT2 WAS 3X10 MFZN
4855549601 DECO SENSOR 1 GPPS MILKY
4854955401 BUTTON CH 1 HIPS GY
4856013610 SCREW SPKR FIX 2 SWRM+SK5 L=35
PFC FILTER 1
7172401212 SCREW TAPTITE 4 TT2 TRS 4X12 MFZN BK
4958315210 SPEAKER 2 SP-78128F02
4852083901 MASK FRONT 1 HIPS GY
4921300100 BRAND MARK 1 A1
4856716000 SPRING 1 SWPA PIE0.5
4854864501 BUTTON POWER 1 HIPS GY
No PART CODE PART NAME Q'ty MATERIAL REMARKS
UNITS m/m Designed by Checked by Inspected by Approved by
SCALE N/S K.J.Woo
DAEWOO ELECTRONICS Mechanical Design Team, TV Research Center
MODEL DTH-29U7 CP-830F
REFERENCE
PART NAME DEVELOPMENT DWG
D 4850094
N 4850091U
REV LIST OF MODIFICATION REASON OF MODIFICATION DATE NAME APPR
A2(594mm X 420mm)

7.2 DTH-29U8



7.3 DTH-2881



No	PART CODE	PART NAME	Q'ty	MATERIAL	REMARKS
1	48567160002	SPRING	1	SWPA PIE0.5	
2	48548643012	BUTTON POWER	1	HIPS GY	
3	48555494012	DECO SENSOR	1	PC GY	
4	48528236012	DOOR	1	ABS GY	
5	48550605002	DECO CTRL	1	PVC T0.25	
6	48555617012	MARK BRAND	1	AL (SILVER)	Goodmans
7	48579233002	DOOR LOCK	1	LA701(KIFCO)	
8	48520837012	MASK FRONT	1	HIPS GY	
9	48583111102	SPEAKER	2	12W 8 OHM SP-58126F	
10	71724012122	SCREW TAPPITITE	8	IT2 TRS 4X12 MFZN BK	
11		PFC FILTER	1		
12	48560136102	SCREW SPKR FIX	2	SWRM+SK5 L=35	
13		CHASSIS	1	CP-830F	
14		CRT	1	28" WIDE FLAT	
15	48562154022	WASH RUBBER	4	CR T2.0	
16	48560158302	SCREW CRT FIX	4	L=32	
17	48521589112	COVER BACK	1	HIPS GY	
18	71724016122	SCREW TAPPITITE	6	IT2 TRS 4X16 MFZN BK	
19	48566816302	CLAMP CORD	1	NYLON 66 BLK 5280N	
20	71783012122	SCREW TAPPITITE	1	IT2 WAS 3X12 MFZN BK	
21	48554158002	SPEC PLATE	1	150ART P/E FILM (C/TV)	
22	48581013002	PAD	1	EPS 2881	
23	48580589002	BOX CARTON	1	DW-3	
24	48582156002	BAG PE	1	PE FOAM t0.5x1600x1270	
25	48582138002	BAG INSTRUCTION	1	L.D.P.E T0.05X250X400	

REV	LIST OF MODIFICATION	REASON OF MODIFICATION	DATE	NAME	APPR

DAEWOO ELECTRONICS Mechanical Design Team, TV Research Center

MODEL	DTH-2881	D/N	485009LQ
REFERENCE	CP-830F		

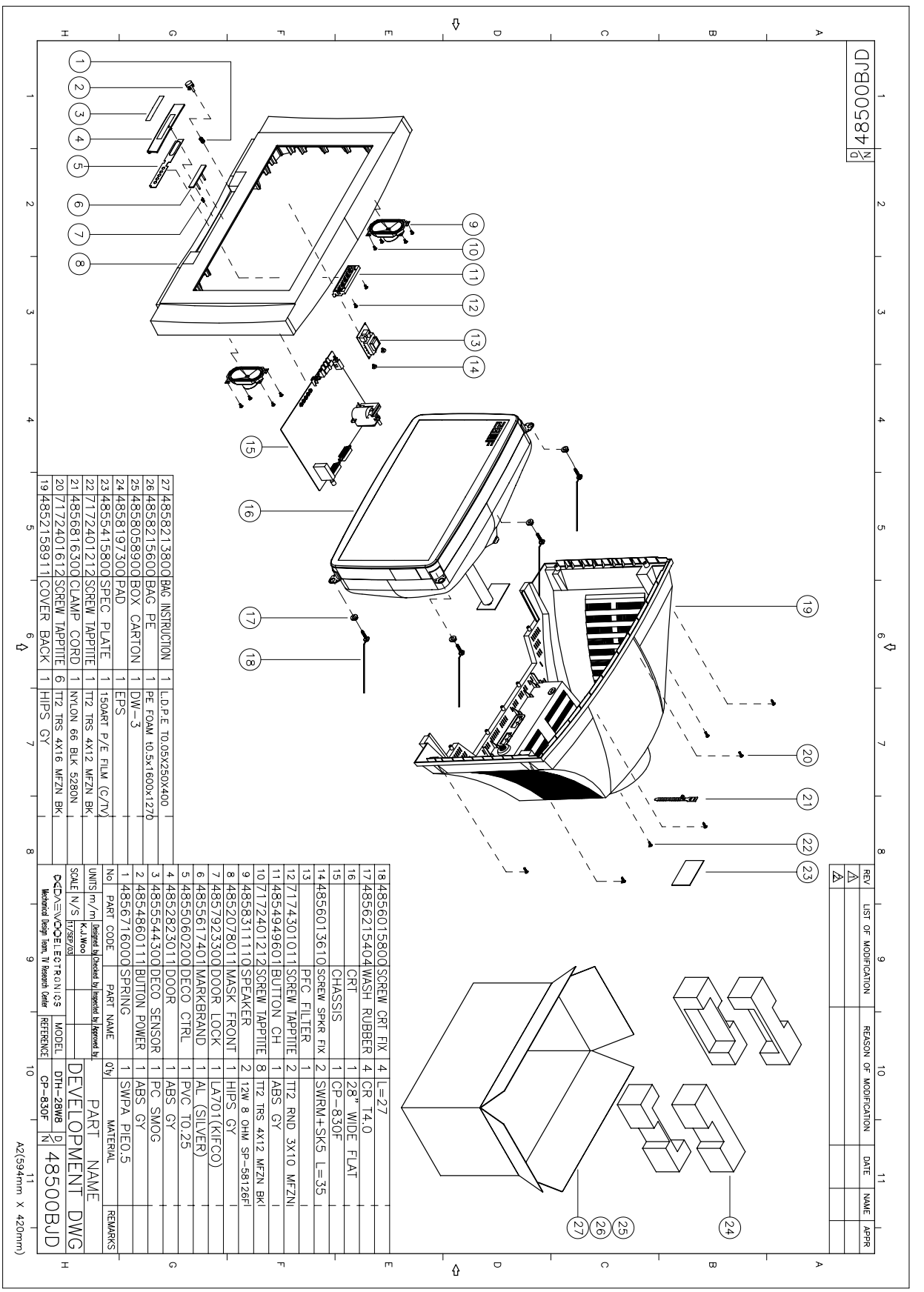
DEVELOPMENT DWG

UNITS: m/m | Designed by: K.J.Woo | Checked by: | Inspected by: | Approved by:

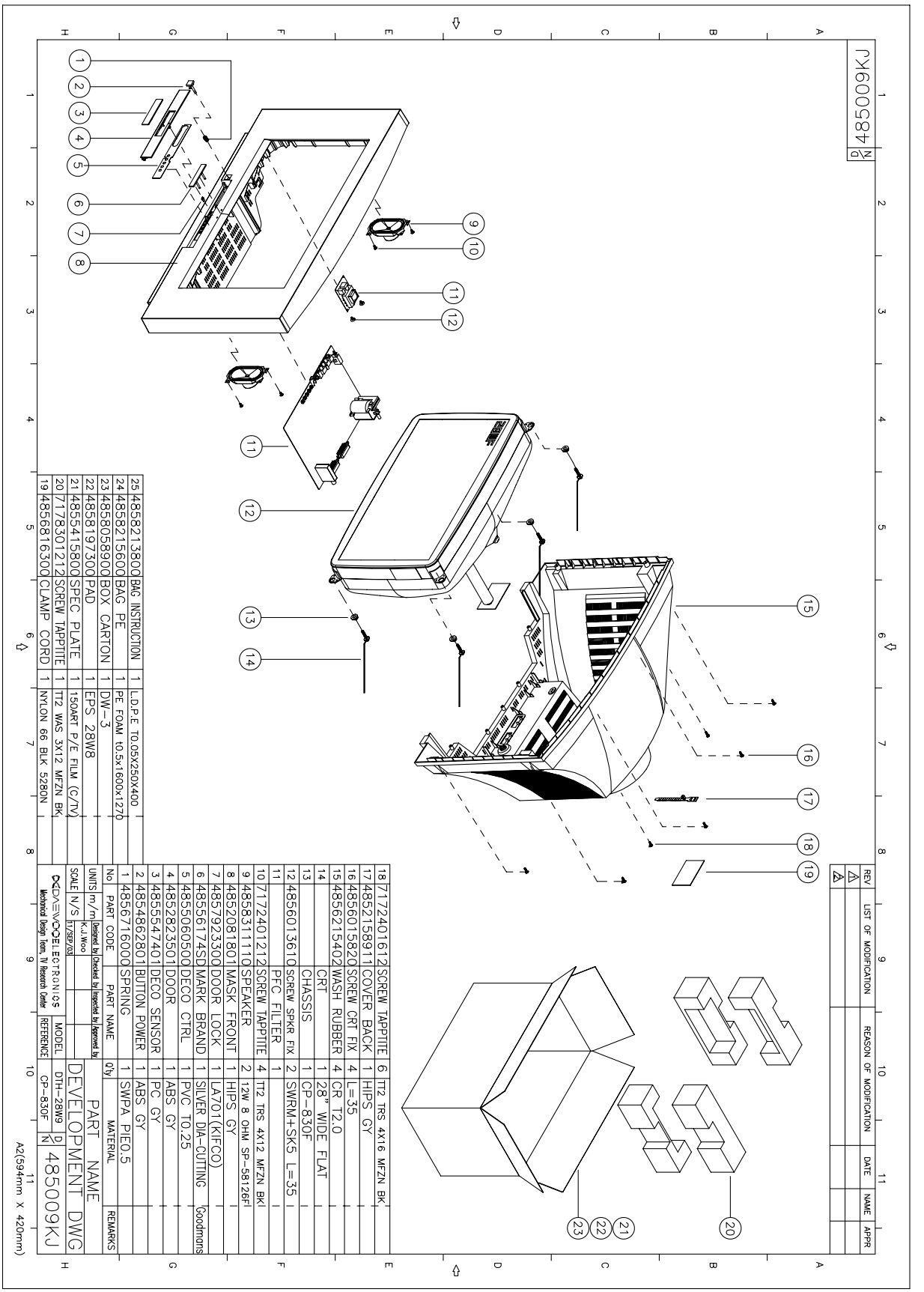
SCALE: N/S | 11/SEP/03

A2(594mm X 420mm)

7.4 DTH-28W8


48500BJD
REV
LIST OF MODIFICATION
REASON OF MODIFICATION
DATE
NAME
APPR
18 485601580 0 SCREW CRT FIX 4 L=27
17 485621540 4 WASH RUBBER 4 CR T4.0
16 CRT 1 28" WIDE FLAT
15 CHASSIS 1 CP-830F
14 485601361 0 SCREW SPKR FIX 2 SWRM+SK5 L=35
13 PFC FILTER 1
12 717430101 1 SCREW TAPPTITE 2 TT2 RND 3X10 MFZN
11 485494960 1 BUTTON CH 1 ABS GY
10 717240121 2 SCREW TAPPTITE 8 TT2 TRS 4X12 MFZN BK
9 485831111 0 SPEAKER 2 12W 8 OHM SP-58126F
8 485207801 1 MASK FRONT 1 HIPS GY
7 485792330 0 DOOR LOCK 1 LA701(KIFCO)
6 485561740 1 MARKBRAND 1 AL (SILVER)
5 485506200 DECO CTRL 1 PVC T0.25
4 485282301 1 DOOR 1 ABS GY
3 485554430 0 DECO SENSOR 1 PC SMOG
2 485486011 1 BUTTON POWER 1 ABS GY
1 485671600 0 SPRING 1 SWPA PIE0.5
No PART CODE PART NAME Q'ty MATERIAL REMARKS
UNITS m/m Designed by Checked by Inspected by Approved by
SCALE N/S 11/SEP/03 K.J.Woo
DCDA≡VCODE ELECTRONICS Mechanical Design Team, TV Research Center
MODEL DTH-28W8
REFERENCE CP-830F
PART NAME DEVELOPMENT DWG
D/N D
48500BJD
A2(594mm X 420mm)
19 485215891 1 COVER BACK 1 HIPS GY
20 717240161 2 SCREW TAPPTITE 6 TT2 TRS 4X16 MFZN BK
21 485681630 0 CLAMP CORD 1 NYLON 66 BLK 5280N
22 717240121 2 SCREW TAPPTITE 1 TT2 TRS 4X12 MFZN BK
23 485541580 0 SPEC PLATE 1 150ART P/E FILM (C/TV)
24 485819730 0 PAD 1 EPS
25 485805890 0 BOX CARTON 1 DW-3
26 485821560 0 BAG PE 1 PE FOAM t0.5x1600x127b
27 485821380 0 BAG INSTRUCTION 1 L.D.P.E. T0.05X250X400

7.5 DTH-28W9



No	PART CODE	PART NAME	Q'ty	MATERIAL	REMARKS
1	4856716000	SPRING	1	SWPA P1E0.5	
2	4854862801	BUTTON POWER	1	ABS GY	
3	4855547401	DECO SENSOR	1	PC GY	
4	4852823501	DECO CTRL	1	ABS GY	
5	4855060500	DOOR	1	PVC T0.25	Goodmans
6	4855617450	MARK BRAND	1	SILVER DIA-CUTTING	
7	4857923300	DOOR LOCK	1	LA701(KIFCO)	
8	4852081801	MASK FRONT	1	HIPS GY	
9	4858311110	SPEAKER	2	12W 8 OHM SP-58126F	
10	7172401212	SCREW TAPPTITE	4	ITT2 TRS 4X12 MFZN BK	
11		PFC FILTER	1		
12	4856013610	SCREW SPKR FIX	2	SWRM+SK5 L=35	
13		CHASSIS	1	CP-830F	
14		CRT	1	28" WIDE FLAT	
15	4856215402	WASH RUBBER	4	CR T2.0	
16	4856015820	SCREW CRT FIX	4	L=35	
17	4852158911	COVER BACK	1	HIPS GY	
18	7172401612	SCREW TAPPTITE	6	ITT2 TRS 4X16 MFZN BK	
19	4856816300	CLAMP CORD	1	NYLON 66 BLK 5280N	
20	7178301212	SCREW TAPPTITE	1	ITT2 WAS 3X12 MFZN BK	
21	4855415800	SPEC PLATE	1	150ART P/E FILM (C/TV)	
22	4858197300	PAD	1	EPS 28W8	
23	4858058900	BOX CARTON	1	DW-3	
24	4858215600	BAG PE	1	PE FOAM t0.5x1600x1270	
25	4858213800	BAG INSTRUCTION	1	L.D.P.E T0.05X250X400	

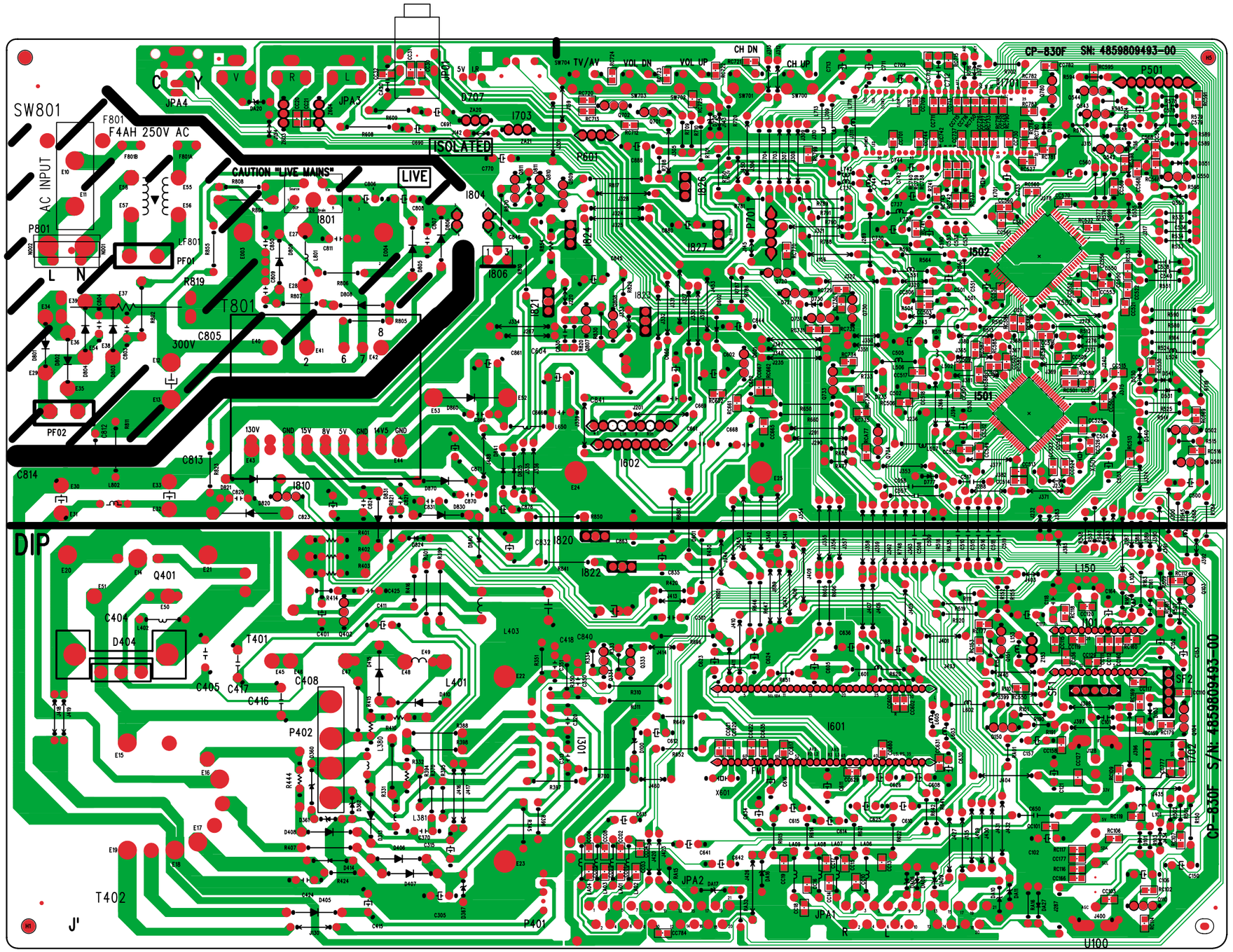
REV	LIST OF MODIFICATION	REASON OF MODIFICATION	DATE	NAME	APPR
A					
B					

UNITS	m/m	Designed by Checked by Inspected by Approved by
SCALE	N/S	K.J.Woo BY/SEP/03
DAEWOO ELECTRONICS Mechanical Design Team, TV Research Center		
MODEL REFERENCE	DTH-28W9 CP-830F	
DEVELOPMENT DWG NO	4850009KJ	

A2(594mm X 420mm)

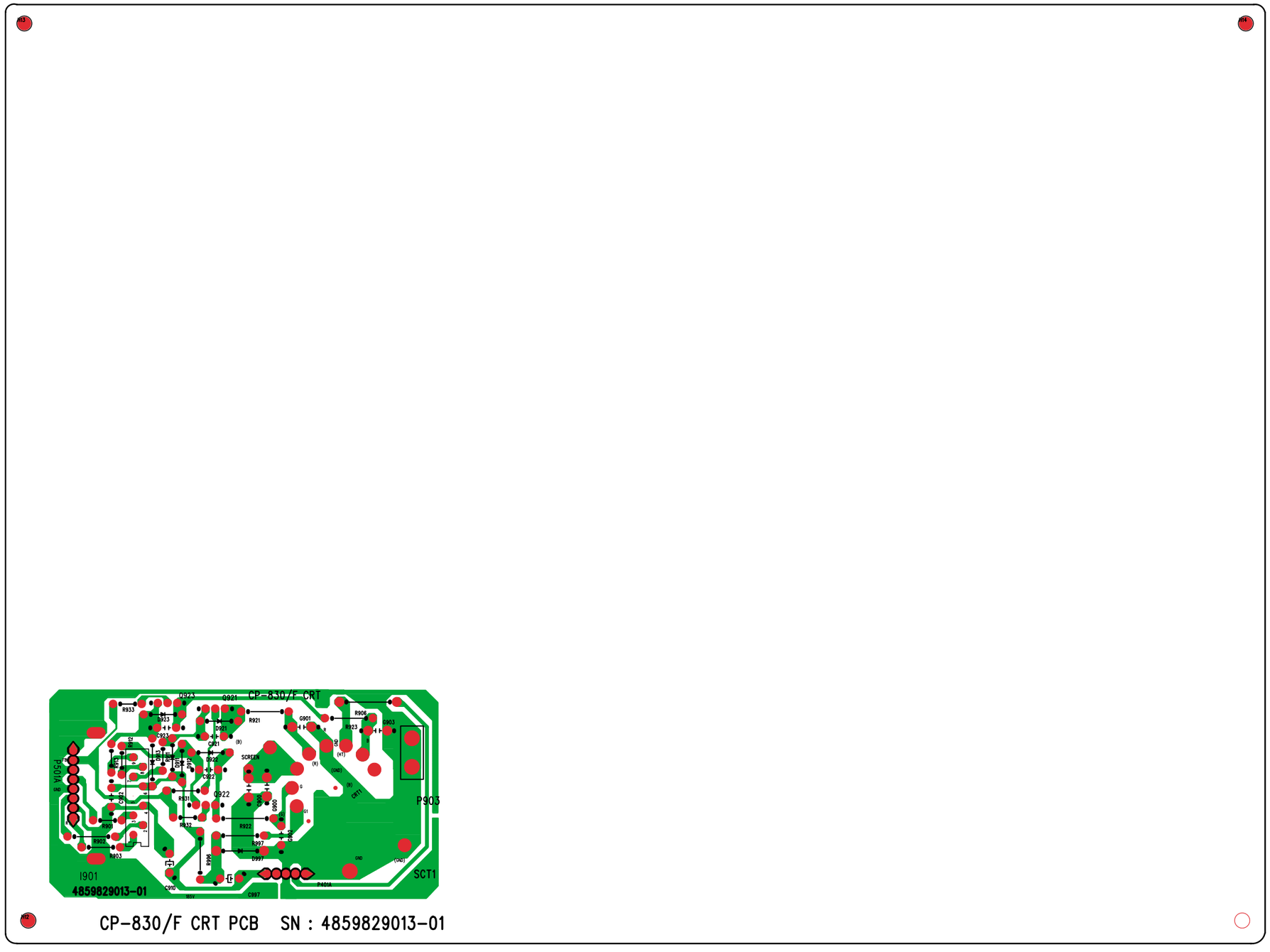
8. PRINTED CIRCUIT BOARD

8.1 MAIN PCB

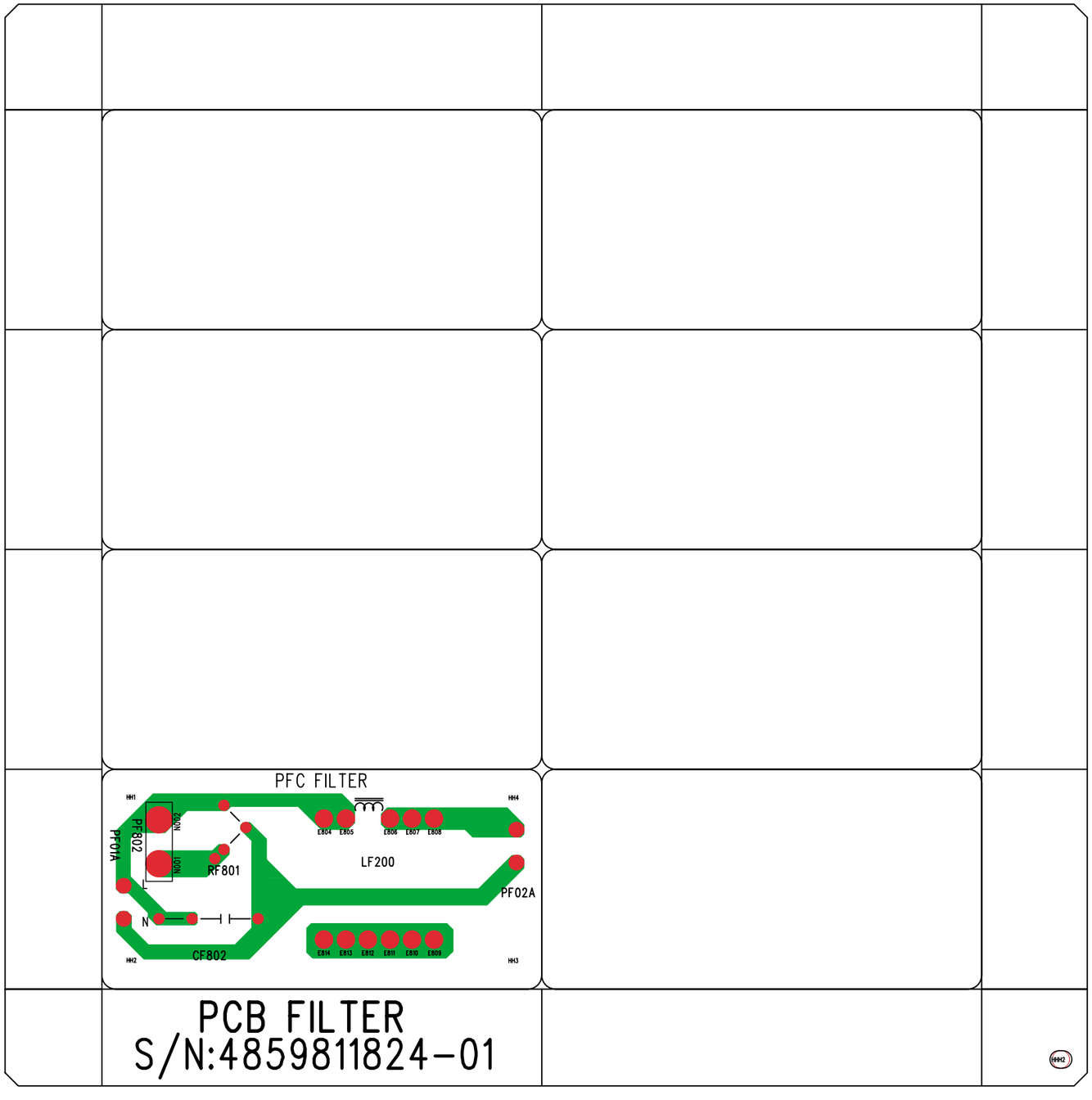


MAIN PCB.pcb – Mon Oct 06 18:06:58 2003

8. PRINTED CIRCUIT BOARD
8.2 CRT PCB

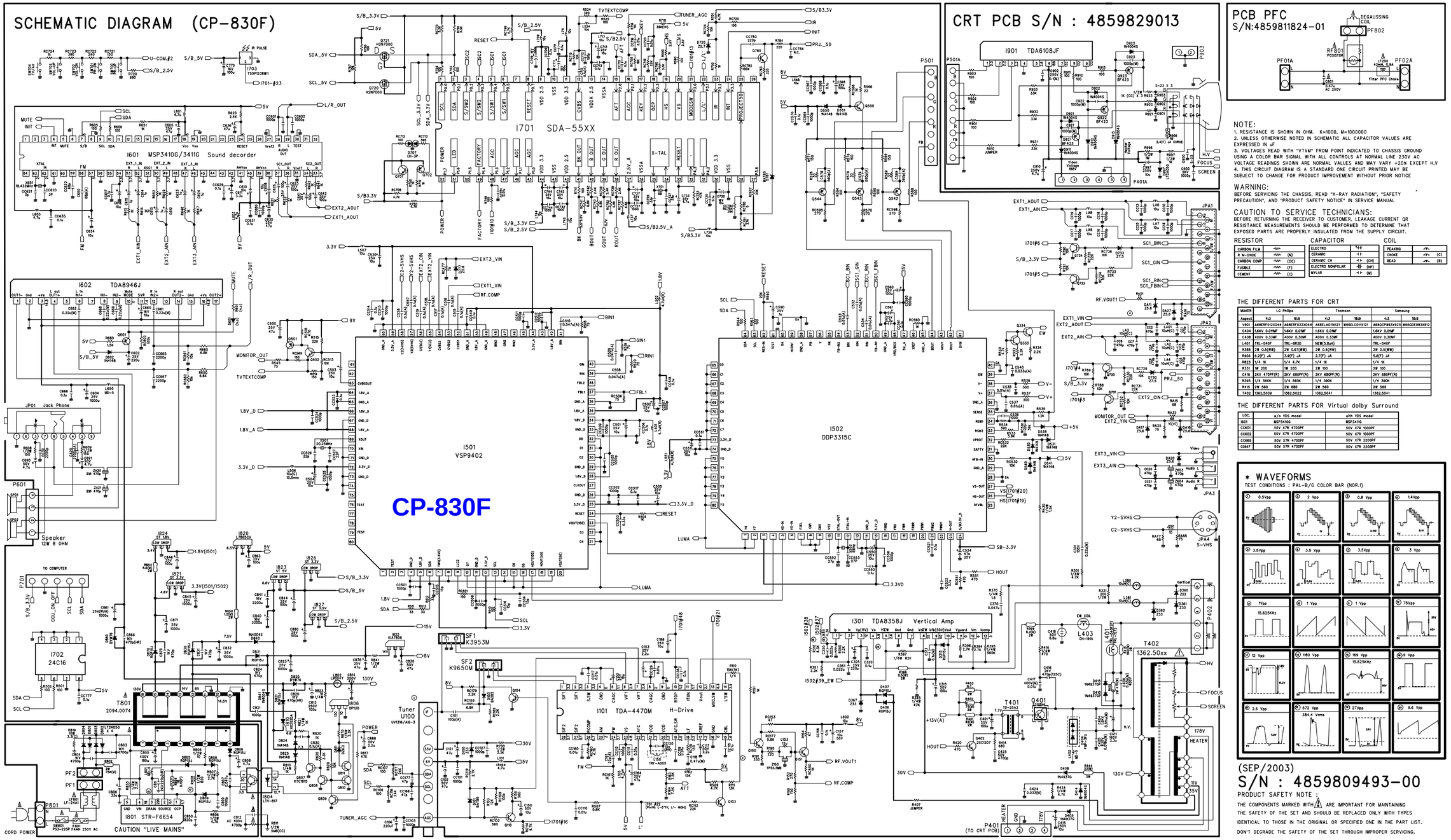


8. PRINTED CIRCUIT BOARD
8.3 PFC PCB



PFC FILTER PCB.pcb – Mon Oct 06 18:11:11 2003

9. SCHEMATIC DIAGRAM


SCHEMATIC DIAGRAM (CP-830F)
CRT PCB S/N : 4859829013
I901 TDA6108JF
P501
P401A
P903
PCB PFC
S/N:4859811824-01
PF802
RF801
POSISTOR
PF01A
PF02A
Filter PFC Choke
NOTE:
1. RESISTANCE IS SHOWN IN OHM. K=1000, M=1000000
2. UNLESS OTHERWISE NOTED IN SCHEMATIC ALL CAPACITOR VALUES ARE EXPRESSED IN uF
3. VOLTAGES READ WITH "VTVM" FROM POINT INDICATED TO CHASSIS GROUND USING A COLOR BAR SIGNAL WITH ALL CONTROLS AT NORMAL LINE 230V AC VOLTAGE READINGS SHOWN ARE NORMAL VALUES AND MAY VARY +20% EXCEPT H.V
4. THIS CIRCUIT DIAGRAM IS A STANDARD ONE CIRCUIT PRINTED MAY BE SUBJECT TO CHANGE FOR PRODUCT IMPROVEMENT WITHOUT PRIOR NOTICE
WARNING:
BEFORE SERVICING THE CHASSIS, READ "X-RAY RADIATION", "SAFETY PRECAUTION", AND "PRODUCT SAFETY NOTICE" IN SERVICE MANUAL
CAUTION TO SERVICE TECHNICIANS:
BEFORE RETURNING THE RECEIVER TO CUSTOMER, LEAKAGE CURRENT OR RESISTANCE MEASUREMENTS SHOULD BE PERFORMED TO DETERMINE THAT EXPOSED PARTS ARE PROPERLY INSULATED FROM THE SUPPLY CIRCUIT.
RESISTOR
CAPACITOR
COIL
THE DIFFERENT PARTS FOR CRT
THE DIFFERENT PARTS FOR Virtual dolby Surround
* WAVEFORMS
TEST CONDITIONS : PAL-B/G COLOR BAR (NOR.1)
I701 SDA-55XX
I601 MSP3410G/3411G Sound decorder
I602 TDA8946J
I501 VSP9402
I502 DDP3315C
I101 TDA-4470M H-Drive
I301 TDA8358J Vertical Amp
I801 STR-F6654
I702 24C16
T801 2094.0074
T402 1362.50xx
T401 TD-25A2
Q401 2SC1207
CP-830F
(SEP/2003)
S/N : 4859809493-00
PRODUCT SAFETY NOTE :
THE COMPONENTS MARKED WITH ⚠ ARE IMPORTANT FOR MAINTAINING THE SAFETY OF THE SET AND SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL OR SPECIFIED ONE IN THE PART LIST. DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.

DAEWOO

DAEWOO ELECTRONICS Corp.
686, AHYEON0DONG MAPO-GU
SEOUL, KOREA
C.P.O. BOX 8003 SEOUL, KOREA